CHEMICAL INDUSTRIES

VOLUME XXXIV NUMBER 2

Second-hand Experience

THIS is not the first depression this country has struggled through. The causes of the world-wide depression of 1825 and of our post-war panic of 1873 and the cures proposed to bring back recovery were so like our present discussions that one marvels we have learned so little. Moreover—and this is the more remarkable—the effects of this present depression were felt first and were much more severe in Europe, yet we are curiously blind to the fact that there is not a single experiment of the New Deal which has not been tested out abroad and within the past ten years.

For every item in the Roosevelt program, be it aimed to reform or towards recovery, be it agricultural or industrial, financial or social in its intent, has had its recent comparable counterpart abroad and most of them are "old stuff" to those who have not forgotten—or who ignore—the experience of previous business cycles.

Insofar as the New Deal affects industry, it bares a startling resemblance to the regimes of the Social Democrats in Germany and the Labor Party in England. With differences in detail as to execution and under different popular labels, the objective of restoring prosperity by curtailing production and increasing the purchasing power of workers was common and fundamental. Shortened hours, "political wage scales," compulsory arbitration of labor disputes, encouragement of rationalization and discouragement of added production are prominent symptoms of this effort in all countries.

What does it mean to us then that in both England and Germany during the past eighteen months there have been political revolts which have stopped these efforts "to lift business by its boot-straps" and replaced them by programs designed to help industry, especially the heavy industries, to recover normally and by the force of increased industrial activity naturally to cure unemployment, restore buying power, and start again the economic upswing? It should mean a great deal when we realize that during the past six months both these countries have reduced the percentage of unemployment and increased the percentage of all sorts of business activity more than we have. They have done so, not by means of costly reliefs and experimental reforms; but by giving up political influences and restoring economic factors. The experience of all panics of which we have any record confirms the soundness of these conclusions.

Some Figures That Really Count

Everybody has been talking, all throughout the depression, about the splendid future that lies before the chemical industry. The man on the street believes that we are in for a great expansion. Wall Street backs up his opinion. Do we believe it ourselves?

Money—even in fifty-cent dollars—talks, and in order to test our own optimism, we recently asked half a dozen representative companies about their building programs. The individual figures are, of course, confidential, but American Cyanamid, Columbia Alkali, Dow, Monsanto, Pennsylvania Salt, Victor, and Westvaco report that last year they spent in new construction and equipment, $10,165,184, and that next year they propose to spend $20,850,000.

That would appear to be just a little better than about 100 per cent. confidence in the future. All these companies with but one exception, plan to spend more money in construction next year, than last. Purposely, we omitted du Pont and Allied, the two biggest companies, in order not unduly to pad the figures, and the result seems to us extremely significant. Here is not only the most tangible evidence of the belief in the return of recovery, but also a very considerable expenditure to be made in the capital goods field, the revival of which must be the very basis of prosperity.

Motor-Alcohol Economics

Last year's legislation to compel the blending of alcohol with automobile gasoline has already been re-introduced into Congress. As the chemical industries are of a mixed mind on this proposal, it may be wise, before the issue comes to a point in Washington, to consider briefly European experience. Abroad, motor alcohol is an old story. For thirty-five years on the Continent it has been regularly employed, straight and blended, as a fuel for internal combustion engines, chiefly of the stationary type and largely for agricultural uses, and blending for motor car use goes back to war days. After the war Germany, in order to support agriculture, passed a law compelling gasoline distributors to purchase set quantities of alcohol from the Government Alcohol Monopoly. The quantity of alcohol has been increased to 60,000 tons in 1928, 80,000 tons in 1932 to 110,000 tons in 1933. Italy, Austria, Hungary, Latvia, Czecho-Slovakia, Jugo-Slavia, all compel the purchase of gasoline by their gasoline distributors.

It is extremely interesting to compare the prices of gasoline and alcohol as recently published in *The Economist* (London) as follows:

Country	*Cost of Alcohol Pence per Imp. gal.*	*C.i.f. cost of First Grade Gasoline Duty excluded Pence per Imp. gal.*
Germany	41	4
Czecho-Slovakia	35	3¾
Latvia	18	4¼
Hungary	30	4¼
Italy	26	4¼
Jugo-Slavia	21	4¾

The high price of alcohol compared with gasoline is hidden from consumers in all of these countries by the import duties and consumption taxes which run from twenty cents to forty-five cents a gallon, while the alcohol is tax free. Similar misrepresentations have been made in this country, and if we are to have alcohol-blend motor fuel, it is well to recognize that this is frankly a farm relief movement. As such, we will be forearmed of fallacies in arguments which presume that we shall have a permanent surplus of corn or that it is sensible economics to feed distillery waste.

In France, in 1932, the Government bought 2 million hectoliters of beet-sugar alcohol at a cost of about 550 million francs, sold it to the gasoline distributors for 208 million francs, and lost 282 million francs. At the same time the Government lost in taxes 142 francs for every hectoliter of alcohol sold instead of gasoline, a further loss of 284 million francs, bringing the total cost to 566 million francs. At fifty cents a bushel, a ten per cent. alcohol blend in this country, produced at a cost of 39c a gallon, would, with gasoline at six cents, cost the country 500 million dollars. It would be very much worthwhile, from the point of view alike of our chemical industry, the farmer, the Government, and the automobile owners of the country, were somebody to figure out with extreme care what any definite, proposed alcohol motor-fuel blend will cost in dollars and cents.

Quotation Marks

The "New Deal," not only in America but also throughout the world, gave a stimulus to economic expansion generally; but the uncertainties created by a fluctuating and incalculable dollar, the economic contradictions of NRA, and the pronounced drift towards a policy of greater self-sufficiency produced a setback in America—with the result that the world is less advanced on the road to prosperity than it would have been if a less ambitious and more consistent programme had been pursued in Washington.—*The Economist.*

A Notable New Solvent

By S. J. Cohen

President, American Chemical Products Co.

A SOLVENT, which is now manufactured in the United States in industrial quantities, which although very closely analogous to water in its solvent powers, nevertheless combines with acids to form salts similar to aniline salt, while it is itself neutral, plainly possesses all sorts of chemical and commercial possibilities.

ACETAMIDE PROPERTIES

Formula—CH_3CONH_2	
Molecular Weight	**59.05**
Specific Gravity	**1.159**
Solubility in 100 c. c. Water	**97.5^{20}; 178^{60}**
Solubility in 100 c. c. Alcohol	**25.0^{20}**
Solubility in 100 c. c. Ether	**31.5^{20}; 72^{60}**
Melting Point	**81.0°; 69.4°**
Boiling Point	**222°**
Crystalline Form	**Hexagonal**

Acetamide is such a chemical, and naturally attracted to its very unusual combination of chemical properties about eight years ago, I have intermittently since that time investigated not only all the various methods of its manufacture but many of its solvent properties and its reactions with other chemicals. In view of the recent interest stirred in acetamide by its display among "The New Chemicals of Commerce" at the Chemical Exposition and the publication of a study of its solvent properties by Professor Stafford of the University of Oregon in the "Journal of the American Chemical Society," some notes on its chemical characteristics from the industrial point of view may be interesting and suggestive of commercial uses.

Acetamide, the amide of acetic acid, possesses quite unique chemical characteristics. It contains a methyl group, a carbonyl group, allied to the ketones, esters, and acids; an hydroxyl group, allied to the alcohols and water; an amino group, allied to ammonia. Obviously its chemical possibilities, especially in organic synthesis, are exceptional, and it has in fact long been used in the preparation of methylamide and a number of complex organic medicinals. Of particular interest is the quality of acetamide which permits it to combine with acids, and yet it partakes in fact of both acid and basic characteristics, while itself neutral in reaction. Professor Stafford has pointed out very clearly its analogy to water in the close correspondence shown by the solubilities of inorganic compounds in the two and also by the chemical behavior of the dissolved substances; by the close resemblance of the conductivity curves of salts in the two solvents; by the electrodeposition of metals in acetamide solutions, and finally by indications that acetamide seems to function like water of crystallization.

Naturally there are numerous patents covering different applications of acetamide. There are two German patents for its use in ammonium nitrate explosives; the Winthrop Chemical Co. has a patent for its use in tablets to make rather insoluble medicinal agents instantly soluble; another patent covers its use as a solvent in the manufacture of "safety glass" using it as a bond for gelatin and cellulose acetate. In combination with formaldehyde it has long been known as a powerful antiseptic agent, trade-named "Formicin". It has also been employed in soldering flux combinations, and Worden has indicated that it is useful as a plasticizer for cellulose acetate, which I have empirically confirmed in the laboratory.

Out of my experience with the material I am certain that since acetamide is soluble in its own weight of water and possesses definite hygroscopic powers, it will prove to be a very good moistening agent, keeping glue, gelatine, leather, cloth, and various films and coatings soft and pliant. It can be made up in an efficient anti-freeze solution and it may be useful in cosmetic creams and lotions. Perhaps it might work very well in this connection to absorb excess alkali. On the other hand, it might be very useful as an antacid in lacquers and in explosives. It would appear to be possibly useful as a buffer agent in salt solutions. Kauffman (Amer. Dye. Rptr. 21, 644-9) clearly indicated its possibilities as an activator in textile bleaching, and it may certainly be expected to work as a water soluble penetrating agent.

The above suggestions give some indication of the wide variety of uses which may be expected to develop for this interesting chemical. They do not cover the field for, as an example of the unexpected uses, we know that acetamide has already been used as a special food for growing yeasts. They do indicate, however, that a new weapon of considerable value has been added to our chemical armory.

Chemical Prices and Gold Values

By Thomas F. H. Leyden

AMERICAN chemical prices have actually declined since we abandoned the gold standard. Amid all the enthusiasm over stronger markets and advances in chemical quotations it comes as a blow to discover that in actual gold values the advance in chemical dollar prices represents a net loss in gold value.

Nothing could bring home to chemical executives more forcibly the pitfalls of a shifting currency than to translate our current chemical quotations into the equivalent of the value of the dollar as appraised by foreign exchange rates in terms of gold. And nothing could be more illuminating, just at this time, than to compare the course of our chemical prices, since we went off gold, with the course of prices in England under the same monetary conditions. The results of such comparison are rather surprising. The dollar values of our supposed price advances reduced to gold terms are a very distinct shock.

Twenty heavy chemicals—acetic acid, sulfuric acid, anhydrous ammonia, caustic soda, copper sulfate, chlorine, sodium bichromate, betanaphthol, phenol, formaldehyde, ethanol, methanol, carbon tetrachloride, ethyl acetate, lithopone, red lead, zinc oxide, sodium nitrate, trisodium phosphate, and caustic potash—this group contains items from every major branch of the industry, and their price variations averaged act as a useful price barometer of the chemical industry.

TABLE I

Chemical	Variation in quoted price	Variation in real price
Caustic potash	16.3% increase	27.7% decrease
Acetic acid	11.9% "	30.6% "
Betanaphthol	9.1% "	32.3% "
Chlorine	5.6% "	34.6% "
Caustic soda	3.4% "	35.8% "
Sulfuric acid	No variation	38.1% "
Anhydrous ammonia	" "	38.1% "
Formaldehyde	" "	38.1% "
Lithopone	" "	38.1% "
Phenol	3.4% decrease	40.1% "
Red lead	6.1% "	41.8% "
Sodium bichromate	8.0% "	42.9% "
Zinc oxide	11.5% "	45.1% "
Synthetic methanol	12.5% "	45.7% "
Ethyl acetate	14.7% "	47.1% "
Carbon tetrachloride	16.0% "	47.9% "
Copper sulfate	16.0% "	47.9% "
Ethanol	18.7% "	49.6% "
Trisodium phosphate	20.0% "	50.4% "
Sodium nitrate	37.6% "	61.3% "

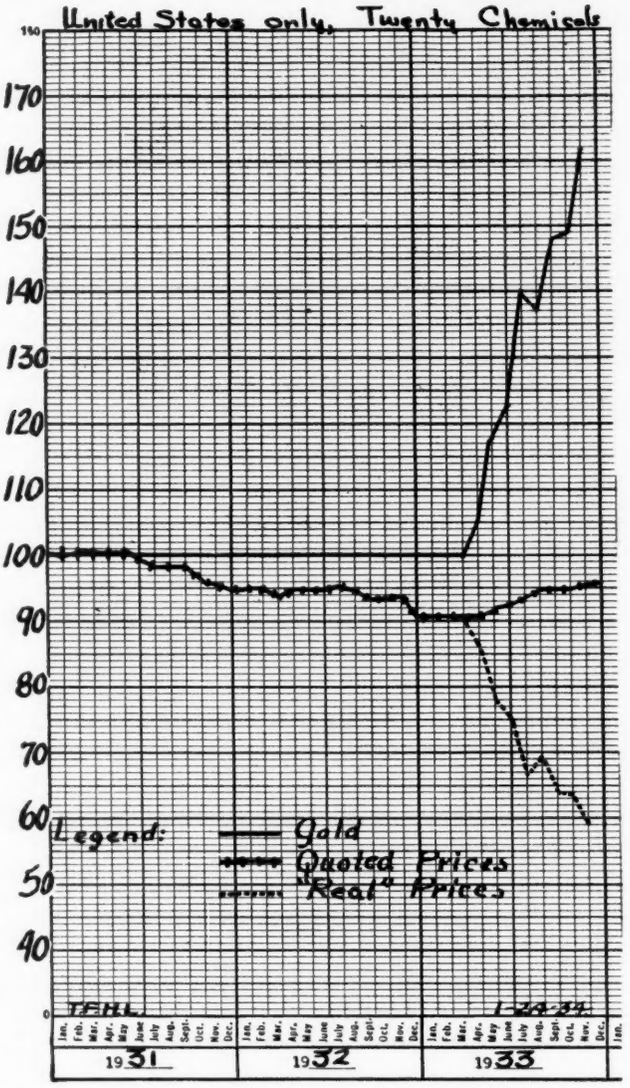


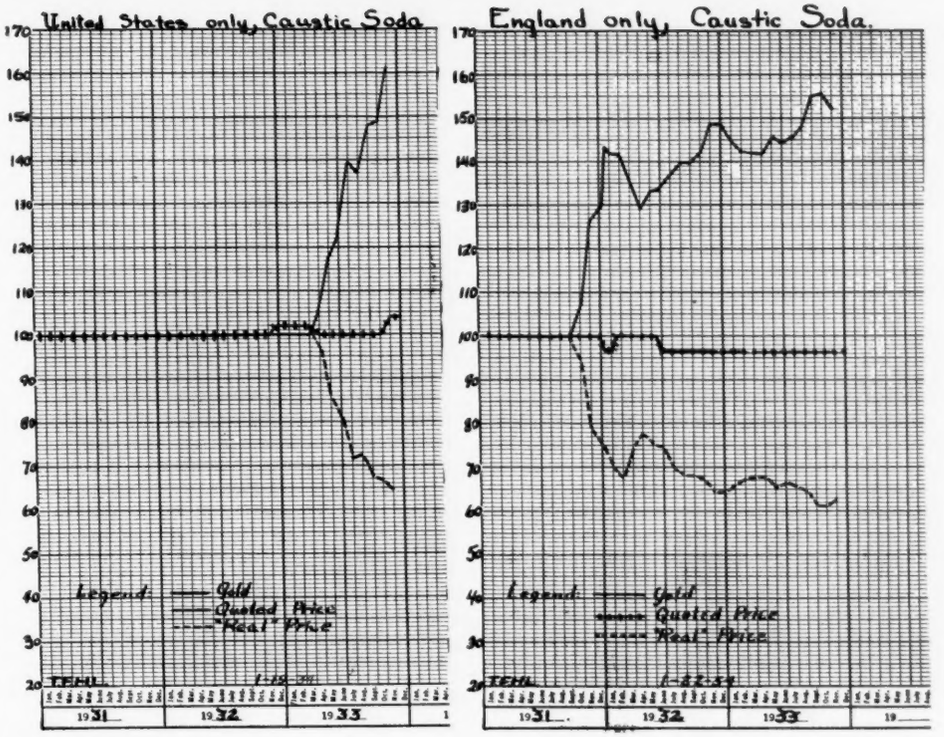
Chart I shows price trend of 20 representative industrial chemicals in the U. S. from January, 1931 to November, 1933.

The unweighted average price (dollar quotations) of this group declined approximately 10 per cent. from January, 1931, to March of 1933. By December of last year (nine months) approximately half of the loss was recovered. On April 17, 1933 we unceremoniously slipped the gold standard anchor. Now instead of interpreting one variable (price) in terms of one fixed unit (gold) we are struggling to interpret correctly two variables which, of course, leads constantly to misleading and erroneous conclusions.

Chart I shows the trend of the quoted prices' average expressed in the percentage variation from 100 as of January, 1931. The chart shows the similar trend of the price of gold. Lastly, the chart shows the trend in the "real" price of the 20 chemicals, taking into consideration the depreciated value of the dollar. The index numbers used were calculated as the ratio of the monthly price totals to the price total for January, 1931—they read, therefore, directly in per

cent. of the January, 1931, price total.

The observation was just made that while prices appear to be rising they are actually declining. One glance at the chart indicates not only the fact that they are declining, but that the decline so far (nine months of being off the gold standard) has been much more severe than that which occurred from January, 1931 to March, 1933; further that the accelerated pace of the decline now is much more rapid than at any time previous to March of last year. Measured in gold the chemical producer is receiving on the average approximately 40 per cent. less for his products now than he did in January, 1931. In March, 1933, previous to our abandonment of the gold standard, the decline amounted to approximately 10 per cent. below what he received in January, 1931. And yet, between March, 1933 and December, 1933, quoted prices expressed in dollars rose five per cent.



Charts II, III, and IV indicate plainly that the effects of inflation in England and the U. S. on chemical prices are comparable.

In charts II, III, and IV the similarity between the trend of prices in Great Britain and the United States is plainly shown. In every case abandonment of the gold standard was immediately reflected in higher quoted prices (dollars or pounds) but much lower "real" prices when due consideration and allowance is made for the depreciated state of the currency. When gold is made the basis of measuring value the supposed price advances are translated into sharp declines.

Of the 20 chemicals employed in obtaining the average unweighted price index in Chart I, five showed an increase in quoted price between January, 1931, and December, 1933, eleven showed a decrease, and four no variation. The greatest percentage increase in quoted price was observed in caustic potash and the greatest percentage of decrease in sodium nitrate. One hundred dollars worth of sodium nitrate in January, 1931, would be worth only $62.40 in currency or $38.70 in gold in December, 1933. Table I shows the gain or loss in quoted prices between January, 1931, and December, 1933, and also, the variation in the "real" prices between the same periods. A simple comparison between the two sets of percentages is illuminating and a strong indictment of inflation.

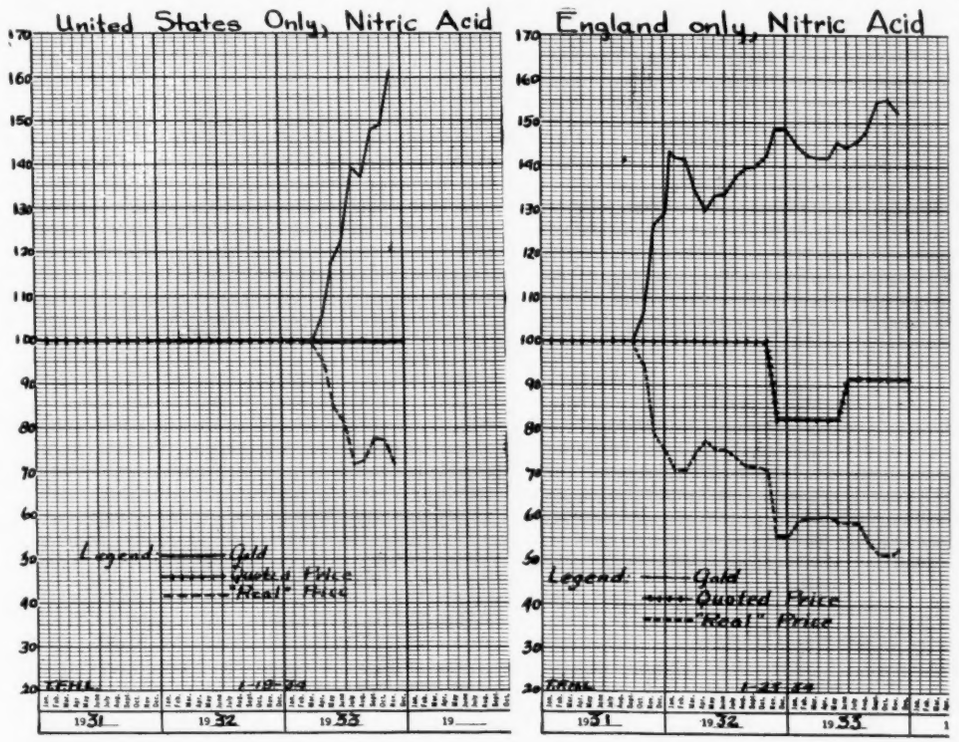


Chart III. Dropping of the gold standard in both England and the U. S. has had the effect of lowering the price of nitric acid measured in gold.

Abandonment of the gold standard has left upon the doorstep of the American producer numerous prob-

lems. Among the 20 chemicals are some interesting variations of the effect upon the price situation. A considerable amount of caustic potash is imported. Imported items, generally, were the first to show price rises following the abandonment of the gold standard. The dollar expressed in terms of foreign currencies immediately declined. More dollars were, therefore, needed to buy the same quantity. Quotations of imported items were immediately advanced in this country. The problem of the producer of such items as chlorine, caustic soda, etc., products produced from raw materials purchased within the United States, is again different from the problem of the bichromate of soda producer, manufacturing from raw materials purchased outside of the country.

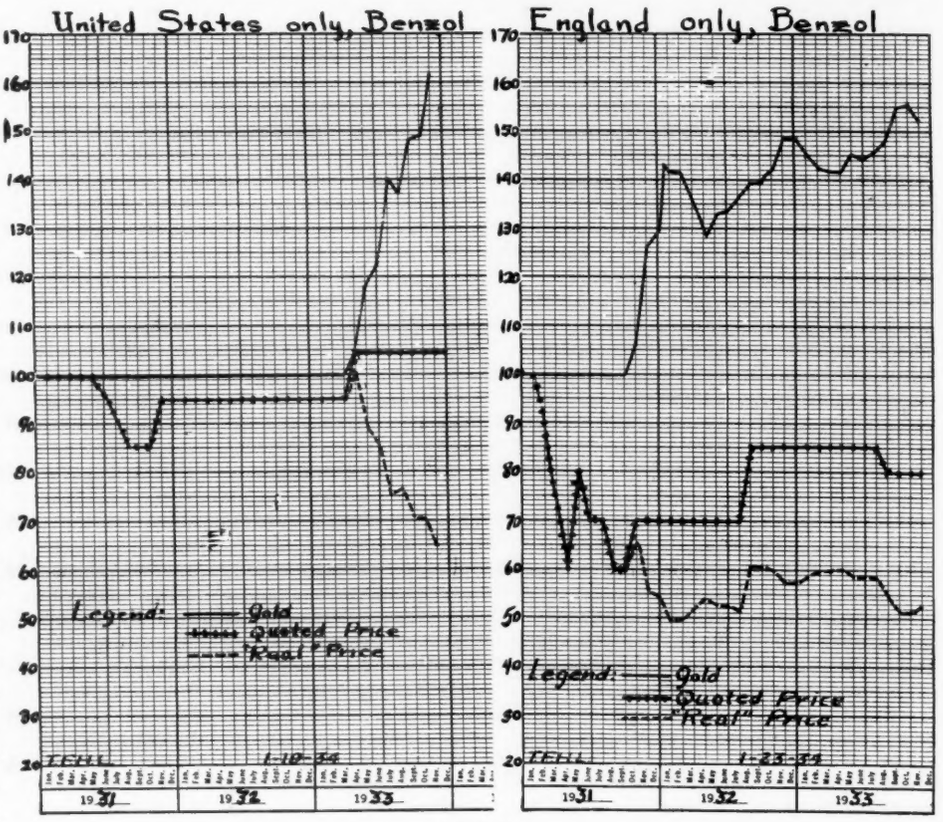


Chart IV

What is the effect of the abandonment of the gold standard on exports? During 1932 and the first quarter of 1933 our exports of chemicals were adversely affected by the depreciated state of the currencies of our chief chemical competitors—Germany, England, and Japan. Markets that we had dominated for years were taken away. With the dollar no longer a dollar but anything between 50 and 60 cents we are now able to re-enter and to recapture these lost markets. But it is significant that foreign chemical trade journals have commented editorially on how poorly we have been able to capitalize on our improved export status due to, undoubtedly two things, one, the general indifference of the American chemical manufacturer to foreign business, and second, the poor organization of the average American chemical manufacturer for taking care of such business. To the German and English chemical manufacturers export business represents a large, and essential portion of the total; to the American producers (aside from two or three lines, such as sulfur, naval stores, and phosphate rock) export trade is decidedly secondary to domestic business.

And let it not be forgotten that in the export business, which we are partially regaining, we are getting much less for our goods measured by gold. Currency depreciation by one country after the other is just a vicious circle. In a great many ways it is quite comparable to the vicious domestic "price wars"—no one gains and in the end everybody loses. But the worst fallacy of all is the belief that inflation raises price levels when in truth it has just the opposite effect. Unless we wish to deliberately choose to duplicate the ostrich we cannot be blinded to the uncontrovertible facts disclosed by charts, I, II, III, and IV.

Dollar Gold Content Officially Reduced

On January 31 President Roosevelt, under powers given to him by Congress, reduced the dollar's gold content from 25.8 grains to 15.21 grains, making its gold value 59.06 plus per cent. of the par fixed by the act of 1900. In other words, the American dollar is now worth 59.06+ cents gold. Actually the dollar has been fluctuating, of course, for months around this figure, anticipating just such an ultimate move.

Two reasons are advanced to justify the depreciated gold content of the dollar. (1) to protect our foreign trade. From the viewpoint of the chemical industry, as we have seen, we stand to gain a little and to lose much. (2) to raise prices. To return to anything like the former price level as measured in gold industrial chemical quotations will have to show dollar price advances that we know are next door to impossible. It is expected that for the time being the approximate halving of the gold content will have very little effect on domestic chemical prices. Items traded in internationally will quite likely be the first to show higher prices, as will also items actively traded in on commodity exchanges. Likewise the metals and their salts will probably show advances shortly, but the big tonnage of industrial chemicals sold on contract basis cannot experience sharp and immediate price readjustments to meet the existing conditions.

Chemists' Contracts

With the Staff Chemist

By Arthur J. Norton

Chemical Director, General Plastics, Inc.

With Consulting Chemists

By Albert L. Hall

Buffalo Testing Laboratories

ARE contracts between chemists and employers necessary? First, with regard to patent rights and ownership of inventions, the answer would be no. State laws in most cases amply protect the employer by ruling that all discoveries made by a salaried employee, whether the work was done on the premises or not, belong to the employer. With hourly wage earners, the wage earner is entitled to his invention if he can prove it was done on his own time. The salaried chemist therefore has no rights to any discoveries or inventions he may make during a term of employment. With such a definite understanding well established by practice, it is not necessary to have individual contracts covering such rights, although it may be desirable to call the attention of a young chemist to such laws.

Second, with regard to definition of terms of employment, the individual case should be the deciding factor. It seems desirable for a chemist with specialized knowledge particularly desired by an employer to insist on a term contract. Otherwise his term of employment may be restricted to the time necessary to obtain such specific information. Such cases are not common for, as a rule, a chemist is not hired for his knowledge, but for his ability. The background of knowledge necessary to develop his ability comes from the firm employing him.

Third, as a protection to the firm or employer, a contract seems desirable. It is often true that a firm gives a man a long term of valuable experience before he is competent to give results commensurate with his salary. It is also true that such a trained employee might be of value to a competitive firm, not because of specific knowledge, such as formulae, but because of the general background of knowledge inbred through years of contact with all phases of the industry. And it is a further threat that such an experienced employee may start a competitive business of his own.

The desirability and necessity of contracts between employers and chemists seems therefore to be entirely on the side of the employer. Except in specific instances, where term employment is specified, the employee receives no direct value as a result of the agreement. His value or consideration, aside from what is given to make the agreement binding, is in the job itself. It is difficult today, especially among the chemical manufacturers and the older, better established chemical industries, to get a job without signing some sort of an agreement.

This situation, where the chemist is practically required to sign a contract before he can work, and where the manufacturer rightly insists on protection, presents a most interesting and important problem. It seems perfectly fair and reasonable that an employee should be protected. On the other hand, restraint of practice of his profession is distinctly disadvantageous to the chemist as it tends to keep his salary low, to narrow the scope of his activity and to prevent true development of the chemist in industrial work.

Common commercial contracts include:

1. A resume of patent and invention rights.
2. A compensation clause.
3. A restraint of trade clause.

The first of these is innocuous and of possible educational value.

The second is necessary for legality of a simple contract, although in most states, a sealed contract implies compensation and requires no statement of such.

On the third subject, the general knowledge of the law is hazy. Spencer says,—to quote freely:

"Contracts that tend unreasonably to restrain persons from engaging in any lawful business, profession or employment are contrary to public policy and void; (1) because they tend to injure the parties making them by diminishing their means of livelihood; (2) because they deprive the public of the services of the parties on what is presumed to be the lines of their greatest usefulness . . . (3) because of their tendency to enhance prices and create monopolies. . . . Yet not all restraint is unlawful. A business man may restrain himself from practicing his trade in competition with the purchaser of his business . . . Thus an

agreement that one will never again carry on or be concerned in the business of an iron-founder is illegal, but a lawyer may legally sell his practice and agree not to practice again in the same city."

The status of an employed chemist may be open to discussion. If he is restrained from working with competitive industries, it may be interpreted as the case of the iron-founder. On the other hand, if he did not restrain himself, his services would be of lessened value.

Commercial contracts generally state that the chemist will not engage in an allied or competitive industry for a term of two or three years. Sometimes direct compensation is made at the time of signing the agreement. Other times it is implied on a sealed contract, and a third method consists of a salary guarantee during any time of unemployment resulting from the observance of the contract. Still other clauses merely state that the employee will not violate confidences or secrets obtained while in the employ of a firm.

Obviously, everything that can be done to educate the chemist to this phase of his relationship to business is part of the duty of this institute. It is just as much a part of our duty to insure adequate protection for the employer.

The interpretation of the law and the application of contracts at present is still largely a personal matter. It is probable that certain groups of employers in the chemical industry have deliberately taken advantage of the situation in order to subjugate the chemist. In fact, they have occasionally helped create the necessity for contracts by espionage. On the other hand, the chemist himself, by unethical practices, has been to blame for creating a distrust among employers. Some employers honestly use the contract only to protect themselves, and pay a chemist accordingly.

Neither side has much actual redress at law—the chemist cannot successfully sue the corporation—and the corporation is undoubtedly at the mercy of unethical chemists.

The answer seems to lie in educational work to create better mutual confidence and understanding. The chemist too often sees large business develop as a result of his work and forgets the years of unfruitful investigation and investment. At the same time, the chemist must be taught to recognize the danger of his position and have available for presentation, through such an organization as ours, constructive, fair contracts. When a chemist is in doubt, if he could turn to us for information, he would appreciate it. Also, I believe the employer would avail himself of some satisfactory solution to this troublesome problem. Many an honest employer is puzzled by the difficulty of being fair to the chemist and to his organization at the same time.

If we could draw up and adhere to and advise nonmembers on a real code of fair competition, it would be of great advantage to the industry.

Contracts as They Affect the Consulting Chemist

The consulting chemist comes in contact with a great many people who desire aid in some form or other. These contacts vary in nature as follows:

1. Advice on the development of new ideas.
2. Actual development of project.
3. Advice during the development of project.
4. Chemical analyses to ascertain causes of trouble in some particular difficulty.

When your client or prospective client first contacts you, you must necessarily be made acquainted with the history of the project, and to be able to work intelligently, must be made familiar with some facts that the client considers of a secret nature, which if disclosed might mean a financial loss.

It may surprise you, but very few written contracts are requested of the consulting chemist. You would hardly expect anyone who was asking advice to go to someone whom they had no confidence in. It must be general knowledge that any consultant would not be in business long, if he disclosed any of his clients' business in any form, for he would not only lose the confidence of his client, but would also lose the confidence of the party to whom he had disclosed it.

It is, however, often you are requested not to make known certain facts which have been given you.

The one time you enter into a contract is when you have as a client, someone who engages you as their consultant on a retainer basis. This is generally a concern of the larger size, and who desires to employ you either because you have had experience in the particular development, or because he wishes to have someone who is capable of coming in and supervising something he does not wish the employees to know about as yet. For instance, he may be preparing to put upon the market some new idea, which he wants to be more of a surprise to his competitors, and to avoid any information leaking out, employs a consultant, whose duty it is to bring the development up to the stage of production. Naturally he does not want this disclosed to any of his competitors, nor does he want you to use such information as you might obtain for anyone's benefit but his own.

Such a contract should cover the following points:

The consultant will confine his services in this project to the client only, and will not engage in like capacity for anyone else in the same line of business at the same time.

The client agrees to engage the consultant for a certain specified time, which is never less than a year, and at certain fees.

The trade secret, or new features which are developed are the property of the client, but any experience gained by the consultant is the property of consultant.

The client should have the option of renewing the contract, but it should be made known that at the end

of the contract the consultant is free to enter into consultation with client's competitors. Of course it must be understood that the consultant should not deliberately go and obtain employment by the use of client's name for whom he has just developed the idea.

I personally think most contracts are one sided, in that they attempt to deprive you of the use of experience you have gained. In other words one should offer to give the benefit of experience and judgment so long as a client desires it, and should not attempt to hurt your client by offering this experience to his competitors while in his employ. Your client should not expect you to turn down prospective clients after he releases you, and never use the experience again. The consultant should not disclose to any future clients that one of his previous clients, mentioning the name, had used some particular process with or without success. He should, by all means, protect his clients whether they are employing him now or not.

To sum up, the consultant must be honest to his profession. He should not divulge projects of any kind to anyone. He should be allowed to use any of the experience he has gained while employed by any of his clients, providing said experience does not conflict with present employment.

The doctor or lawyer are very often in possession of facts of vital importance, given him in complete detail which, if divulged, would mean financial loss to his client. They are seldom put under contract, and are allowed to use the experience gained to their own advantage.

The case rests with the chemistry profession as a whole and the profession should show themselves to be composed of members both upright and honest as men in any other profession.

The Industry's Bookshelf

The Lyophilic Colloids, by Martin H. Fischer and Marian O. Hooker. 246 p., published by Charles C. Thomas, Baltimore, Md., and Springfield, Ill. $4.50.

The work of Fischer and Kooker during the past 12 years is summarized. Its purpose is not only to restate their now widely accepted theory of the lyophilic colloids as originally proposed in 1918, but to adduce further experimental evidence which seems to make it binding. Authors seem to have arrived at an answer, both chemically and physically, to the nature of the lyophilic colloid itself and this without recourse to the so largely self-contradictory notions of micelles and electric charges. A set of colloid dispersions of inverse type is recognized and described. The volume carries suggestive points of view for the chemist who, either in theory or in practice, works upon systems that are concentrated or not wholly of the dilute solution type. To biologists who have been unable to rediscover in living matter the laws of the physical chemists, it brings answer to their "why," setting forth clearly the true significance of the numberless physicochemical measurements that have been made upon protoplasm. Under this head are discussed the solubility and solvent properties of protoplasm, its electrical conductivity, its concentration of hydrogen or hydroxyl ions, its osmotic pressure and its permeability. The nature of acidosis and alkalosis receives separate consideration and from the total picture arrived at of protoplasmic constitution, new light is cast upon the problem of synthesis in organic matter.

1933 Book of A. S. T. M. Standards, 2 vol. Part 1. 1002 p., Part 2, 1298 p., published by American Society for Testing Materials, 1315 Spruce st., Philadelphia. Each part separately $9.00 in half leather, $7.50 in cloth; both parts, half leather $17.00; cloth $14.00.

No introduction is required. These works are so well-known as to make any remarks unnecessary. Of the 185 standards in Part 1, 104 cover ferrous metals, while 70 relate to non-ferrous metals, and 11 involve metallography and general testing methods. Part II contains 285 standards covering many widely used materials, including cement, refractories, coal, paints, petroleum products, rubber products, textile materials, etc. Supplements containing any standards adopted in 1934 and 1935 will be furnished without charge to all purchasers of either part of the book. A complete subject index and convenient tables of contents are given in each part of the 1933 edition. These are designed to conserve the user's time in referring to the diverse materials and subjects covered.

Our Common Enemy: Colds, by the editors of "Fortune". 102 p., published by Robert M. McBride & Co., 4 W. 16 st., N. Y. City. $1.00.

Here are all the important facts about colds—what seems to cause them and what seems to relieve them—for their exact cause and specific cure are both still open to debate. There are remedies, however, which receive the sanction of medical science. These are recommended for what they are worth. Our Common Enemy: Colds sums up the judgment of eminent physicians, for public guidance. This being its design, it clears up a world of misinformation about this infectious plague which costs the U. S. alone about $2,000,000,000 a year, In doing which, it surveys the amazing array of patent medicines which constitute this nation's highly lucrative cold business. It does this dispassionately.

The Secret of Steady Employment, by F. Creedy, 125 p., published by G. P. Putnam's Sons, 2 W. 45 st., N. Y. City. $1.75.

What is the capitalistic system we live under? Why has it broken down? How can we get straight again? Will the NRA do it? This book answers these questions by first giving an account in simple language of the business world considered as a single organization which makes all we want. Then it discusses the economic cycle showing that though there is neither need nor possibility of eliminating it entirely, it could be smoothed out by proper attention to the maintenance of business confidence in difficult times. Finally various suggested means of doing this are criticized, including the NRA.

The Cotton Textile Industry of the SouthernAppalachian Piedmont, by Ben F. Lemert, 188 p., published by The University of North Carolina Press, Chapel Hill, N. C. $2.50.

This book is another in a series of social studies prepared by the University of North Carolina. In collecting materials for this study, the author travelled over 3,000 miles through the mountains of Virginia, West Virginia, Kentucky, Tennessee, North and South Carolina, and Georgia; through the Valley of Eastern Tennessee, and the plateau, the valley and the Piedmont of Alabama; and through the textile-manufacturing sections of the Piedmont from Lynchburg, Va., to Gadsden and Anniston, Alabama, going through 43 mills, visiting the premises of many others and inspecting many mill villages. He drove many miles over dirt roads in the mountains, talking to mountain people and observing their living conditions. He talked with many farmers and observed their living conditions in both the Piedmont and the Coastal Plain in sections remote from the main highways. Main purpose of the study is to ascertain and analyze the reasons for the development of the cotton textile industry in the southern Appalachian Piedmont. The author expresses many interesting opinions on living conditions on farms and in the mill villages.

Lord Melchett Discusses

Company Control—The Shareholder's Share—Too Fixed Assets—Surplus—Ordered Economy and Some Other

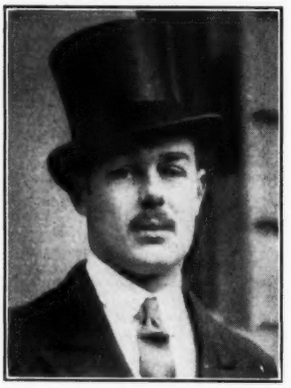
New Business Concepts

OUR industrial world of today differs from the world of even half a century ago, essentially in one respect: we have embarked upon an age of plenty, whereas for the past centuries in which our economic system has been built up we were living in an age of scarcity. The whole of the market system is based upon the idea that there is fundamentally a shortage of those things which man requires to use, with the fact that so far from there being a shortage, there is in almost every case an excess of those things which we want, beyond our power of using them. What has broken down in the modern world is in no way the science of production; it is the science of distribution.

One could use a broader phrase, and say that our economic system generally no longer reflects our productive capacity. Civilization will only continue to survive provided we are able to find new methods and adopt a new outlook on problems that have perhaps been considered in the past in relation to stable conditions in which the answer was "No".

The Basis of Company Accounts

The basis of company accounts today might be said to be a share of some monetary denomination, a £1 share, a 10s. share, or a 1s. share, and that idea has grown up from the early days when people paid so much for a share. That money was spent upon machinery and plant or buildings, which had a real value, apart from their operation value: that is to say, the profits they could earn in operation. Both machinery and buildings in those days were scarce, and machinery and buildings could be sold for some other purpose than that for which the man who ordered them originally intended them. They were called—and the phrase still persists—"solid assets". They were looked upon as a fine thing to have in the balance sheet.



Son of the founder of the I. C. I., Ltd., grandson of one of Britain's alkali pioneers, this scion of distinguished chemical stock is proving to be an original thinker on the new industrial problems.

Today the position is entirely changed. Everybody with industrial experience is well aware that there is no greater drug on the market than a factory that will not pay, and that there is nothing more useless than a process that will not work. There is an enormous amount of machinery in the world today, more than is being used, and scrap machinery has little or no value. The same may be said of factory buildings. They must be specialized. They have not the value they had a century or even 50 years ago. Therefore, one has to realize that the monetary conception of a share is rather misleading. When people have subscribed money in order to erect a factory, or to start a business, it has been spent in that particular way and, unless the factory can earn a profit, is irrevocably gone. So that what everybody buys when buying a share in a modern company is nothing more or less than a share in existing or potential profits. Anybody who buys a £1 share for £1 and imagines that he has necessarily £1 worth of assets behind it, as you all know, is suffering from a grave delusion. The real fact is that he has a share in a going concern.

A share of "no par value," gives a very much more accurate picture to the investor and also to the industrialist himself of the true structure of his company's balance sheet. Americans, as a matter of fact, have not taken full advantage of shares of no par value, because it is the common practice to value them at some conventional figure and still put them in the balance-sheet at a very large figure on the liabilities side. But, as we all know, all balance sheets show a large figure on the liabilities side for their ordinary capital. Big companies usually have a large ordinary capital and a large figure

on the assets side for their machinery, plant and buildings. The procedure then, as the company progresses and makes profits, is to begin writing those assets down.

With all those figures we do not give ourselves a true picture. The ordinary shares should stand as shares of no par value—at nothing; and machinery, plant and buildings at their scrap and site value, which would certainly be very low—very much lower than the money spent on erecting them. Preference shares are rather different. They are based on a comparatively small proportion, as a rule, of the profits of an existing company, or the prospective profits of a company which is to be launched.

Debentures come within the same category. You will all agree that anybody who was advising someone as to lending money on a debenture, certainly anyone who was lending his own money upon a debenture, would not be prepared to take balance sheet figures—would not be prepared to lend the money as against the assets in the balance sheet. What he would want to know would be something about the earnings of the company. One sees at once that balance sheet figures are, as a rule, not a sufficiently good guide for a debenture issue. And I think that serves particularly to show that in the way in which we conduct company accountancy today we do not use the best methods of showing to both ourselves and our shareholders the true position of an industrial or commercial concern.

Adequate Depreciation

It is the practice of prudent accountants to insist on an adequate depreciation in most companies. Now that, in itself, is a large tax upon the profits of industry, and has a very definite economic effect. Taken in conjunction with the taxes that are imposed by the Government, it all has to come off what is earned by the industry.

Let us follow this a little further, and see what becomes of this money after it has been deducted from the profits. Although you see written down in the balance sheet, reserves at a very large figure, those reserves are not necessarily in any way available either for expansion of the business or for replacement of plant, machinery or processes that have become obsolete. So that again the shareholder—I do not think the industrialist would be deceived by this—does not get as clear a picture as he might. What is really vital is that all plant and machinery should at all times be maintained in the highest possible condition of efficiency, regardless of cost, and that that should be a charge against profits. Then, in addition to that, the company ought to create reserves and keep them in such a form that they are available directly, and obviously available, for the expansion of its business or for the replacement of some part of its plant and machinery which, by some sudden change in the technique of manufacture, may be made obsolete in such quantity that the normal method may be inadequate to deal with it. That is a practice which, of course, many companies naturally follow, but it is not necessarily at all clear from balance sheets what is going on.

The old idea—one often heard it used in the old days—was: "Here is a company with large capital and good, solid assets behind it." It gave a great impression of wealth, power and solidity. Those self-same assets, when bad times come, are referred to as "frozen assets"—just the same bits of plant and machinery as they were when described as "solid assets" in good times.

Haphazard Industrial Expansions

To get as true a picture as possible of the industrial activity of all companies is a vital thing if we are ever going to arrive at an ordered period in industry. We have all seen the haphazard industrial expansion which took place in the last decade, say, from 1919 to 1929, and without any doubt we cannot look forward with any confidence to another decade of that type of development. We have got to know a great deal more of what we are doing, and some element of control will undoubtedly be necessary. Whether that control is to be control in the form of Government interference with business, which is always looked upon as such a fearful thing or whether it is done by business men having any initiative, which they have so sadly lacked in the past, and getting together themselves to do the obvious thing, I do not know. But what I am perfectly convinced of is this, that we have to move in the direction of what is called rationalization, which was defined by my father on one occasion as: "The application of scientific organization to industry by the unification of the processes of production and distribution, with the object of approximating supply to demand." In other words, we have to arrive at a far more ordered system of industry, and in the first place we have got to know far more precisely what we are really doing.

One sees in the world at large very great changes taking place—great experiments being made—but they all tend in the same direction. One sees in America, for instance, the example of the NRA, which, while it is not an example one would desire to see followed in this country, is at any rate an interesting experiment which we can observe from afar, and from which we can possibly learn a great deal. One or two features of the NRA are extraordinarily interesting. One does find in more than one of the codes the provision that new factories are not allowed to be erected unless those who are going to erect them can prove that there is a justification and necessity for new buildings and machinery in that particular line of manufacture, and this, of course, is directed to the elimination of wasteful competition.

I believe that in the future it will be necessary to combine two entirely different elements in the manage-

ment and formation of the industrial company. The principal element in our economic system today, the principal driving force, is the natural avarice of man, which is what we rely upon to get the world along. Another very powerful force in the world, a great incentive to human endeavor, is the desire for safety and security—the desire of a man to be able to put away some of his earnings and to keep them safely.

Both elements come into all questions of investment, and, indeed, all industrial effort. There is a type of company which is extremely well established, which has existed for a long period, which has an enormous vested interest in the world markets. It is very often assisted nowadays by some protection from the Government. That type of company has probably already a very regular share value, and does not pay out excessive dividends, pursues a conservative policy, and is looked upon as a safe sort of investment. Then there is an entirely different type—the type which is a pure speculation. Somebody has an idea that they can make something better or cheaper than anybody else, that they have some entirely new product which the world wants, that they are able to perform some service for mankind that has not been performed before, or are able to perform it better, and they want to make money out of it. Those who go in with them and invest in their company take a purely speculative chance in the hope of a large reward. Between those two extremes there are, of course, gradations, and we may come to the point where regulation, perhaps of even a severe type, might be imposed upon the first type of company with a well established business and national obligations because of the assistance it gets from the nation, while leaving as free as possible the other type of company which is making an effort to start something new—people who might be called the adventurers of the industrial world; people who are vitally necessary if enterprise is to be maintained.

Necessity of Ordered Economy

We cannot attach too much importance to the necessity for order in the industrial system. We are faced with a very great challenge—a challenge from the East. There are large, intelligent, active, progressive populations like Japan, and there are the millions of China and the millions of other people living on a very much lower standard than we can possibly subsist on—not than we do subsist on, but than we can possibly subsist on. They are able to challenge our business by producing at a far lower cost chiefly owing to their lower wages. Now we have got to have an answer to this, and I am perfectly certain, for my part, that the reply of the *laissez-faire* type of economy is quite impossible. If you are going to have an economy such as the last century where everybody is left to shift for himself and hope he will find the best way out, I think you will undoubtedly be faced with competition from the East which will cut into your trade to such an extent that it will be knocked to pieces. It seems to me the answer of the West will be, first of all, protection; that is essential; and, secondly, ordered economy which enables a comprehensive program to be worked out and ordered progress to be arrived at. We have to show our ability in that direction. We have to realize that many of the things which were dear to us in the past may not be able to exist in the future.

Just one example of what I mean: one could point to a good many cases where a country with ample natural resources and plenty of labor has wanted something done—roads made, or a dam made, or something of that sort—and they have been in a depressed condition financially, and, with an unbalanced balance sheet, unable to borrow money. Owing to troubles of that kind, this work has not been done. Why should that country, which had the natural resources, and which had the labor, wait until somebody brought it a piece of paper or simply made a book entry, before they could get on with the work? It is absolutely absurd, and it cannot be tolerated. I am certain that we shall have to learn to devise a national economy from which this kind of fallacy is eliminated. It may require some revolution in thought, but I do not think any of us can believe that a revolution in thought is not necessary when we look back on the past two or three years.

I see no reason to believe that the economic nationalism which is so much deplored by many authorities is against the natural trend of world development. In every direction that one looks one sees that science is enabling every country to make more and more things for itself and to have a smaller reason for importing from other countries. That trend of science is likely to continue for a very long time to come. If it changes, it will be necessary to go back to another system, but at the present the direction of scientific development—and I think that direction will be maintained for a long time to come—necessitates a certain amount of economic nationalism. It necessitates people making things for themselves, because you will not be able to prevent the scientist producing new processes, and you will not be able to prevent industrialists exploiting them or the politician coming along and saying: "Why should not we make these things here and employ people who otherwise would be out of work?" That tendency on the one hand, and, apart from that, the very wide complexity of the modern world, seems to me, to enforce a certain amount of economic isolation, perhaps in groups, perhaps in countries, that will enable us to get control of our economic development. You may put it in this way. The men do not yet exist who could make a Five Year Plan for the whole world, but it is possible you could find people who could make a Five Year Plan for England. I am certain you could find men with sufficient intelligence to make a Five Year Plan for Wiltshire. If you come down in your requirements, it will be easier to rationalize the world.

Catalysts for Coal Hydrogenation

By C. H. S. Tupholme

INTEREST in coal hydrogenation as a sound commercial process has received considerable stimulus by reason of Government support given to I. C. I.'s project to build a large hydrogenating plant. The latest contribution to this study is an investigation conducted at the Government Fuel Research Station into the comparative values of various catalysts, and the results given in a discussion before the Institute of Fuel, in England.

Several catalysts were used, the same coal being used throughout. This coal was chosen in order to reduce the catalytic effect of the inorganic constituents to the minimum. The coal selected contained 1.2 per cent. ash. Its analysis was as follows:

	Per cent. of ash-free dry coal
Carbon	84.0
Hydrogen	5.4
Nitrogen	1.8
Sulphur	1.0
Oxygen and Errors	7.8

The catalysts were, in general, employed as powders, and were merely stirred into the coal. Other methods of applying the catalyst were tried, such as by precipitation from solution on the coal or by the use of volatile catalysts. No very pronounced improvements resulted in these cases.

Substances of Particular Interest

Effects of a very large number of substances have been examined, and a selection which possesses particular interest listed in (Table I). Results are given of the treatment under similar conditions of Beamshaw coal in the absence of catalyst. In this case the amount of unconverted coal is high, 49.8 per cent., and the chloroform-soluble material produced is only 31.1 per cent., inclusive of 21.5 per cent. of distillable oil; the amount of hydrogen consumed during the hydrogenation is 2.8 per cent. of the coal.

Figures for the total hydrogen reacting are divided in the table into two columns, showing respectively the hydrogen obtained as hydrocarbons in the residual gas, and the difference which represents that which is obtained in the liquid and solid products of reaction. As the solid residue of unconverted coal is always depleted of hydrogen, this difference figure is a valuable guide to the amount of hydrogen fixed in the liquid products. Hydrogen utilized to form hydrocarbons represents an unnecessary consumption.

In a large number of materials all degrees of activity have been found. Certain substances have been found to have a deleterious action, others are practically inert, and a limited number have been found to possess high activity. Those which have a deleterious action are, for example, alkaline oxides, such as lime and magnesia.

Oxides Possessing Moderate Activity

Nickel oxide is not an effective catalyst, since the solid residue amounts to 55.1 per cent., while for nickel oleate the corresponding figure is only 10.2 per cent. This difference emphasizes the importance of the particular form in which the catalyst is used. Other oxides, such as those of iron and zinc, possess moderate activity and produce good yields of chloroform-soluble material with improved amounts of hydrogen combined in the liquid products.

The addition of another oxide to one which shows moderate activity can result in greatly enhanced activity. Titanium oxide alone is quite inert, but when present with iron oxide in the proportion of one part in 10, the mixture possesses an activity superior to that of iron oxide alone, since the amount of chloroform-soluble material produced is increased from 51.9 to 64.3 per cent. This phenomenon probably explains the efficiency of the luxmasse which Bergius employed in his process, as this substance contains iron oxide and titania in approximately these proportions.

Molybdenum oxide in the form of ammonium molybdate shows no special activity unless a large proportion, 2.5 per cent., is employed. When only 0.1 per cent. is added, the conversion to liquid is no better than in the absence of catalyst. In view of the activity of molybdenum compounds in the hydrogenation of tar and oils under similar conditions this may point to some essential difference between coal and these materials. Even with the larger proportion of

TABLE I

The Effect of Catalysts on the Hydrogenation of Coal in the Absence of Vehicle

Per Cent. of Ash-free Dry Coal

Catalyst Description	*Per cent. of coal as used*	*Residue of unconverted coal*	*Total hydrogen reacting*	*Molecular Hydrogen fixed in:— Hydrocarbons in residual gas*	*Liquid and solid product (difference)*
Nil	....	49.8	2.8	2.7	0.1
Calcium oxide	2.5	....	...	...	...
Magnesium oxide	2.5	....	2.7	2.0	0.7
Bismuth oxide	2.5	41.1	...	...	...
Nickel oxide	0.1	55.1	2.5	2.2	0.3
Nickel oleate	2.5	10.2	4.6	2.8	1.8
Iron oxide, Fe_2O_3	2.5	27.3	4.4	2.5	1.9
Zinc oxide	2.5	10.2	4.7	3.6	1.1
Titanium oxide	2.5	36.9	3.5	3.1	0.4
Iron oxide Titanium oxide	2.29 0.21	12.0	4.5	2.7	1.8
Ammonium molybdate	0.1	48.6	3.4	2.2	1.2
Ammonium molybdate	2.5	9.3	4.2	2.0	2.2
Iodine	0.1	24.0	3.9	2.0	1.9
Hydriodic acid	5.0	22.8	5.0	2.0	3.0
Zinc oleate	2.5	27.0	4.1	3.1	1.0
Germanium oxide	0.1	10.5	4.7	3.2	1.5
Lead oxide, PbO	2.5	16.4	4.0	2.5	1.5
Lead oleate	2.5	10.1	4.6	3.0	1.6
Stannous hydroxide	0.1	9.8	4.8	2.1	2.7
Stannous hydroxide	0.01	25.6	3.7	2.1	1.6
Stannous hydroxide	0.05	11.0	...	...	...
Tin oleate	2.5	6.5	5.6	2.9	2.7
Tin tetraethyl $Sn(C_2H_5)_4$	0.1	10.7	4.4	2.9	1.5
Stannous hydroxide Molybdenum oxide	0.1 0.1	7.8	4.6	2.6	2.0

molybdenum the amount of hydrogen reacting is less than in the case of good catalysts.

The behavior of iodine and hydriodic acid is of special interest in view of the value of these substances in hydrogenation. Here again the quantity used is of importance. With 0.1 per cent. of iodine, the yield of chloroform-soluble material inclusive of spirit from the active charcoal is 58.6 per cent. of the coal, as compared with 64.6 per cent. when 5 per cent. of hydriodic acid is employed; but whereas the proportion of distillable oil in the former case is 28.1 per cent. of the coal, in the latter it is 49.9 per cent. This yield of distillable oil is higher than those found with any other substance. It is possible that with small amounts of iodine, inter-reaction with the metal of the vessel prevents the iodine exerting its full effect.

On the whole, the most active catalysts are compounds of the metals, germanium, tin and lead. Special attention has been paid to the effect of tin compounds in view of the small quantities which appear to influence hydrogenation. It was surmised at one time, in order to explain the distribution of the catalyst over the coal particles, that, under the conditions of hydrogenation, either tin was volatile or else volatile compounds were formed. It has been shown quite definitely that the volatility of tin at high temperatures is inappreciable under hydrogen pressure. Also stannous sulfide, which might conceivably be formed during the early stages, is not volatile and is reduced to metallic tin under reaction conditions. No indication has been obtained of the presence of volatile tin compounds in the hydrogenation gases. Volatile organic compounds of tin have been prepared and tried as catalysts, e. g., tin tetraethyl, but no particular advantage appears to be derived from the use of such substances.

The influence of catalysts is felt, not only in the extent to which hydrogenation takes place, but also in the composition of the products obtained.

Zinc Production 1933

Primary metallic zinc output from domestic and foreign sources in 1933 was nearly 49 per cent. higher than 1932 and 5 per cent. larger than the output of 1931. Apparent deliveries to domestic consumers were about 58 per cent. higher than in 1932. Stocks at smelters and electrolytic refineries were reduced and on November 30 were 23 per cent. lower than those on hand at the beginning of the year. Exports of slab, rolled and old zinc for the year will probably be less than one-third of those recorded for 1932 while imports, which amounted to only 349 tons in 1932, may total 2,000 tons or more. The output of primary metallic zinc from domestic ores in 1933, as reported by producers from figures of actual production for eleven months and estimates for December, was about 307,200 short tons, an increase of 48 per cent. over the 207,148 tons produced in 1932. Nearly 800 tons of zinc were produced from foreign ores in 1933. No foreign zinc was reported at domestic plants in 1932 or 1931.

GLUE—
Grades and Uses

By George I. Cooper

SEVERAL years ago, over at the Colloidal Chemistry Symposium at the Massachusetts Institute of Technology, Professor McBain of England was asked to define adhesion. He replied that it is very difficult to define and that he liked to compare adhesion with its opposite, lubrication. He stated that an intensive study of lubrication will throw light on the mechanics of adhesion. This analogy has always remained with the writer and has been very valuable to him as a guide while doing adhesive research.

Animal Glue and Gelatin

Although it is difficult to distinguish certain gelatins from glues, in general, glues have a greater adhesive power than gelatins, are darker in color and more odorous, and are made from poorer quality of raw materials than are gelatins. Of the gelatins, that converted by chemical treatment to photographic gelatin is invariably made from the highest quality raw materials, and the finished product is used by manufacturers of photographic plates and films. In the United States, gelatins are marketed in flaked and sheet form, and in Europe in sheet form.

Of the glues, hide is of better quality than extracted bone, although certain grades of the latter compare favorably with the lower grades of the former. Hide and/or extracted bone glues are used in the woodworking industry and in the manufacture of paper boxes, paper bags, calcimine, gummed paper, playing cards, molds or plastic casts, wall paper, abrasives, match heads, printers' rolls, furniture, automobile bodies, and barrel, wall and cloth sizing. Although in general, either of these glues can be used provided the price, when the difference in quality is taken in consideration, is more or less the same, hide glue is generally used where flexibility is required, where the glue joint might absorb moisture and become weakened in fine cabinet work, and on work where quick setting is desired. Extracted bone glue is generally used in the manufacture of paper boxes, gummed paper, and on applications where a slow setting glue is desirable. In connection with thin veneer work extracted bone glue is usually thickened with hide glue to prevent the bone glue from penetrating the veneer.

Glues are produced in numerous grades and are usually blended before marketing. Domestic glues are blended with glues of both domestic and foreign origins to standards maintained by the producer or specified by the purchaser.

The quality of domestic glues is judged either by their jelly strength and viscosity or by the Cooper standard which is essentially a finger test. The foreign plants grade glues entirely upon color, clarity, odor, or similar standards. In the United States, glues are marketed in ground, flaked, and recently in pearl form; in Europe, they are marketed in cake, sheet, and pearl form. Glue exported to the United States is usually ground.

Manufacture of Glue and Gelatin

All gelatins and glues of animal origin are made either from bones or hide trimmings, fleshings, etc. The manufacture of glue or gelatin from hides is a longer process than that from bones, and more equipment is required. To illustrate, hide trimmings and fleshings have to be soaked, limed to dissolve out the albuminous and mucinous constituents, and thoroughly washed. This requires numerous wash mills and liming vats and takes several weeks time. Finally the hide stock, thoroughly cleansed, properly plumped or swollen, and repeatedly washed is ready for the extraction of glue or gelatin.

Such procedure is not necessary when bones are used. If extracted bone glue is to be made, the bones are crushed, fed into large steel closed vessels and degreased by percolating a solvent over the bones until the extraction is considered complete. The grease-bearing solvent is drawn off, and steam is blown through the tanks in order to remove all traces of the solvent from the de-greased bones. They are then usually rumbled or "polished" in rumbling drums which remove bone dust and small particles of bones, which are sold either as is, or with subsequent grinding, as chicken feed. The bones are then treated with dilute hydrochloric acid to remove mineral salts and the liquor is treated with lime-yielding calcium phosphates (fertilizers). The bones are then ready for extraction of glue.

The actual extraction of glue and gelatin from properly prepared raw materials is done by means of hot water. Several extractions or runs are made, each successive one requiring higher temperatures, for longer periods and yielding lower grades and smaller amounts. The liquors are filtered (particularly well in the case of high grade gelatins) and the processing from here on varies according to the product to be made and the particular type of equipment employed.

If photographic gelatin is being made, chemicals are added to the liquid gelatin either before or after filtration. The solution is then put in small containers, chilled, cut into sheets which are placed on drying frames and dried. It is then sorted, tested, usually packed in one pound packages, and labeled.

This kind of gelatin is made from the choicest of raw materials and with the greatest of care. Like other gelatin and glue, it is blended, but it is always sold on sample and never from specifications.

If glue is being made, it is usually chilled on moving belts in the United States and in small containers in Germany. The moving belt is a labor-saving device. It consists of an endless rubber belt about two feet wide with a curb on each side. Liquid glue is run onto one end, passes through a chilling tunnel, emerges congealed, is automatically cut into lengths of about three feet and dropped onto drying trays. It is then dried, either flaked or ground, tested, packed into barrels, boxes or bags, labeled and is ready for sale. Abroad glue is chilled in small containers either cut in sheets or cakes, and is then dried. If the glue is to be exported to the United States, it is usually ground; if not, it is sold either in cake or sheet form.

If pearl glue—a form in which either hide or extracted bone glue can be produced—is being made, the glue liquid instead of being subjected to costly operations, is dropped from a colander into a coagulating bath (usually benzene) in which it solidifies in pellets or pearls. It is then removed and stored in bins where the adhering benzene evaporates. Even though there is a considerable labor saving in the pearl glue process, the cost of necessary equipment is higher than that required for the production of glue in other dry forms. This pearl glue process originated in Germany where patents were taken out before, during and after the war. Although it is now being made in the United States under license by the Chemical Foundation, the domestic production is small. In pearl glue the color, clearness, etc. can be seen which is of particular advantage in Europe where the quality of the glue is judged largely by its appearance; but it is not so important in the United States where glue is sold on the basis of other standards.

Domestic Production

The domestic production of hide glue and extracted bone glue is shown by tabulation at bottom of page compiled from reports of the Bureau of Census.

In addition to the above production, an annual average of approximately 35,800,000 pounds of green bone glue, which has materially lower unit value than either of the other two principle kinds, was produced in the latter two years.

Exports of hide and extracted bone glue are not distinguished in the official statistics from other glues of animal origin. From 1926 to 1931, inclusive, total exports of glue of animal origin, chiefly to Canada, the United Kingdom, and Sweden, have averaged approximately 2,250,000 pounds annually, valued at $390,000.

Gelatin

Total production of inedible gelatin as reported biennially by the Bureau of Census was as shown below:

Year	*Production (Pounds)*
1926	.....
1927	2,030,978
1928	.....
1929	1,712,799
1930	*1,944,137

*Data obtained by Tariff Commission.

Exports: Exports of inedible gelatin are negligible.

Just when and where animal glue originated, we do not know. The time was at least 4,000 years ago and the place, in all probability, Egypt. A stone carving, picturing the process of gluing a rare red-wood to a piece of yellow sycamore is a relic of Thebes in the period of Thothmes III, the Pharoah of the Exodus. This is evidence that the use of glue was perfected before 1400 B. C. Egyptian tombs have yielded many wooden articles glued with animal glue and beginning with about 200 B. C., occasional reference is made either to the glue itself or to the act of gluing. However, it was not until 1690, in Holland, that the first commercial glue plant was founded. Another followed ten years later in England. The first record of a factory in this country sets the date at 1808.

At present, the production of glue is a basic industry. Its manufacture depends exclusively upon a product of the farm, and glue making links up agriculture and manufacture more closely than almost any other manufactured article. Moreover, glue is essential in the fabrication of articles of great commercial value and many uses.

It has been said that animal glue serves you from the day you are born and placed in a cradle until you are laid to rest in a casket. Since you live in a civilized country and use common, modern appliances, this statement is correct. The more important uses of glues may be grouped for convenience under the following general headings:

Woodworking	Leather (Binding and Sizing)
Paper Sizing	Matches
Cloth Sizing	Rubber
Wall Sizing	Wall Paper
Barrel Sizing	Gummed Paper and Cloth
Plastic Paints	Photography
Calcimine	Protective Colloid
Printers' Rollers	Box Making
Bookbinding	Plastics and Compositions
Dyeing	Abrasives (Paper, Cloth, Wheels)

Hide and Extracted Bone Glue; Domestic Production, 1926-1931

Year	*Hide Glue Pounds*	*Extracted Bone Glue Pounds*	*Year*	*Hide Glue Pounds*	*Extracted Bone Glue Pounds*
1926	58,596,800	9,997,300	1929	53,971,000	14,740,400
1927	61,520,900	10,191,400	1930	54,362,000	13,692,300
1928	58,287,200	11,149,200	1931	49,479,000	9,184,000

Source—Bureau of Census, United States Department of Commerce.

Joint Work: In the case of joint work, many factors enter into the process which determine the quality of the joint. In order to obtain consistently good results there must be coordination between such variables as:

1. Type of material glued
2. Condition of material glued
3. Concentration of glue solution
4. Temperature of glue solution
5. Temperature of room
6. Temperature of material glued
7. Spread (amount of glue solution applied per unit area)
8. Assembly time (time elapsing between spreading of glue and applying of pressure
9. Pressure
10. Length of time under pressure

If any one of these variables departs very far from the normal, trouble may ensue. In the event of a wide change in one of the factors, it is possible to set up a counterbalancing change in one or more of the other factors. Ordinarily, the widest variations occur in the temperature of the room and of the material to be glued. In such cases, corrective changes can be made by adjusting the temperature or the concentration of the glue solution.

The three most common forms of poor gluing practice are represented by the starved joint, the chilled joint, and the dried joint.

Starved joint conditions, as the name implies, arise from an insufficient amount of glue. The result is a weak bond. The most common cause is too thin a glue solution. However, the same result can be brought about by such factors as: Excessive pressure, a too short assembly time, material glued being too warm, glue too warm, glue room temperature too high, too heavy glue spread, or a combination of these factors.

Ordinarily, starved joints can be avoided by decreasing the amount of water mixed with the glue and reducing the temperature of the glue at the time it is applied. Too much water slows up jelling. As a result, the solution remains fluid too long and is forced out of the joint or into the pores of the material (when pressure is applied). It is of the utmost importance that the glue spread .should gelatinize promptly, for then it can maintain itself in the joint and establish a strong bond. A particularly inexcusable mistake is to overheat the wood or other material to be glued and prevent the glue from cooling to its gelatinizing temperature within a reasonable length of time.

A chilled joint is usually characterized by an excess of glue. However, any one or a combination of the following factors will cause the same result: material too cool, glue too cool, too long an assembly time, too light a glue spread, room temperature too low, insufficient pressure, and drafts. Contrary to the starved joint, the chilled joint may be avoided by increasing the water to conform to the assembly time, pressure, and temperature. As the temperature varies with seasonal changes, the proportions of glue and water should then be changed accordingly. The chief reason for weakness in a chilled joint comes from the glue jellying too much before pressure is applied. Proper penetration, with only normal pressure, is then impossible. The weakness of a chilled joint is threefold: it may result from lack of contact, from poor adhesion, owing to the inability of a glue jelly to wet and hold the second member of the joint; and from internal stresses set up when drying an excessively thick layer of glue.

Dried joints are the result of overheating, especially of the material to be glued. If high temperatures have been maintained for too long a time, water from the glue film will transfer too rapidly into the wood as well as evaporate too quickly into the atmosphere. This will leave behind a partially dried glue which can neither be forced from the joint nor into the pores. Contributing factors are: thin glue solutions, thin spreads, and long assembly times.

In the use of animal glue for sizing purposes, factors similar to those affecting joint work are essential considerations in the quality of the result, the most important for the the gluer being:

1. Fluidity of sizing solution
2. Temperature of sizing solution
3. Concentration of sizing solution
4. Type of material sized

The fluidity is controlled by the viscosity of the solution which, in turn, depends upon the concentration, temperature of the glue solution, and the grade of glue. The latter, however, may be considered a constant when adjusting the sizing bath to meet varied requirements.

The strength of animal glue is nearly always underestimated. Whenever it is used properly, it provides a factor of safety which is so large as to be a virtual guarantee, that if failure occurs it will not take place in the glue itself. The tensile strength of the best grades of woodworking glue, tested in films as described previously, is 20,000 pounds to the sq. in.

Wood joints, made under proper conditions with the ordinary paper box glues and even lower grades (including the lowest available commercial grade), when ruptured, show wood failure while the glue has held perfectly. This proves that the tensile strength of the lowest grades of animal glue is greater than wood. In one instance, the test of a paper box glue was reduced 50 per cent. by excess heat before applying to the joint. Even in this deteriorated condition, a joint was obtained that was stronger than the wood. The average shearing strength of the strongest commercial woods is less than 2,500 lbs. per sq. in.

Although the lowest grades of glues are capable of producing joints stronger than wood, their use is not recommended for woodworking, because they must be used under more exacting conditions than prevail in commercial shops. However, the grades ordinarily accepted in the category of woodworking glues present a great margin of safety and also have a wide working range.

The Whys and Wherefores of RECOVERY

By Walter E. Spahr, Ph. D.

BUSINESS recovers from a depression in a normal manner when inventories are exhausted. In general, when a recession has run for three to three and a half years, consumers will have sufficiently exhausted supplies of available goods to make it profitable for producers to begin or to extend operations once more. The initial impetus to recovery thus comes from the producers. A normal business recovery can begin in no other way.

There are, of course, abnormal ways of initiating a recovery. For example, a war may create a new and unusual demand for commodities and services. A revolutionary invention, which changes the consuming habits of the great mass of people and which makes possible new and extensive developments in production, may have a similar effect and may arrest a recession or initiate a recovery. But the effects of a new discovery or invention of such far reaching significance are more akin to those characterizing a normal than an abnormal recovery initiated by a war. Furthermore, such an abnormal factor as a war ultimately culminates in a business recession when the war ends, whereas a recovery initiated in a normal manner should continue until a state of economic equilibrium is attained; and this balance of production and consumption could continue indefinitely provided the distorting factors, which throw the economic system out, are not permitted to intervene.

The point to be emphasized is that a normal, healthy, and lasting recovery is generated by producers. It does not and cannot arise from anything consumers can do; and all programs which assume some way by which consumers can initiate recovery are doomed to failure. This is so because during a depression consumers' purchasing power, as a result of financial losses and unemployment, steadily declines. And there is no known way to increase the purchasing power of the mass of consumers unless there is increased employment and an increase in salaries and wages. Obviously, these increases cannot be effected unless producers find it profitable to resume or to increase operations.

How do producers find it profitable to resume operations after the consumers' purchasing power has steadily declined? It is because consumers continue to purchase, although at a declining rate, in order to live; and over a period of time this persistent, though declining, purchasing will exhaust the supplies of existing goods which producers have practically ceased to produce. Any demand for goods creates also a demand for services. The result is increased employment and an increase in the purchasing power of the consumers.

This increased purchasing power is spent for goods already produced, not for the goods being produced. It requires time for the latter to reach the market. In this manner, demand relative to supply is increased, the fly wheel of business is pushed off center, there is a tendency for prices to move upward, and recovery is initiated and will continue to expand in a cumulative manner unless interrupted by very important offsetting factors.

Demand relative to the existing supply of goods is increased because producers pay their employees now — daily, weekly, or monthly — for producing goods that will not reach the market until later — varying from weeks to months, and even years. Thus, an increased purchasing power does not meet in the market an increased supply of goods just produced, but a decreased supply of goods previously produced.

The producers can begin productive activities and to pay labor now because of the credit extended by the banks. It is at this point that commercial banks play an important part in aiding recovery. They must stand ready to lend freely to producers who are receiving orders, who have low or exhausted inventories, and who are in a position to begin filling new

orders. Few producers during a depression accumulate sufficient cash to enable them to begin production when the opportune moment arrives. At such times bankers cannot make loans solely on the basis of borrowers' balance sheets. Greater stress must be laid upon inventories, prospects, and orders in hand. When bankers fail to realize this fact they fail to appreciate one of the simplest and most important principles that should guide them in extending loans during the end of a depression and the beginning of recovery.

These loans made by banks to producers provide the means by which labor is paid now for goods being produced. The bank loans thus pass into circulation, create a better market for existing goods, start prices upward, deplete the available supply of goods more rapidly, create new demands for replacements, and provide the means to enable producers to market their goods, repay their loans, and repeat the process.

There is no other important way to increase consumer purchasing power. There is no way in which the commercial banks can put any appreciable funds in the hands of consumers directly. Therefore all programs designed to increase consuming purchasing power directly have no justification whatever in economics, are destined to fail, and always do fail. For this reason, also, campaigns to increase consumer purchasing are futile and absurd.

Dangers Attendant Upon Currency Inflation

The same principle applies to the attempts to initiate recovery by means of currency inflation or devaluation on the widespread assumption that more money, by some mysterious means, will flow directly into the hands of consumers. No economic heresy approaches this idea both in popularity and in potential danger. Currency inflation can reach the great body of consumers directly only if the government, as suggested recently by two intelligent southern gentlemen, would scatter the currency over the country by airplanes or by sending out trucks to distribute the additional money directly—so much per capita. The more conventional methods of currency inflation, operating through government expenditures and the banks, will reach very few consumers directly. But when inflation operates through these conventional channels, the effects are radically different from those produced from a normal initiation of prosperity by producers. Under the stimulus of currency inflation, prices rise, not because there has been an increase in purchasing power growing out of increased employment, but because of an increased reluctance of sellers to sell in anticipation of the depreciation of currency and the consequent appreciation of capital values. Consuming purchasing power is spent and exhausted rapidly in anticipation of further rises in prices and because of *fear* but not because of confidence in the future. Consumers spend to save what they can from the looting by the government, and the great mass of people soon sink to a low level of poverty and distress. Production in time is stalled because producers soon find that it is more profitable to engage in speculative transactions than in productive activities, and the nation is turned into a den of gamblers. Employment and wages do not increase in proportion to prices.

To inflate our currency to increase consumer purchasing power is the height of economic stupidity. It is the most certain way known to impoverish the masses of people. It always has impoverished the people and it always will. Inflation is a condition that exists when purchasing power, either in the form of money or credit, is not fully secured by goods or services that will liquidate it. Inflation, therefore, always involves losses, and its extent is measured by the losses directly attributable to it. Losses mean disasters. To recommend inflation as a means of overcoming a depression is to recommend further disasters.

"Controlled Inflation" a Myth

Some today recommend "controlled inflation". Inflation is of such a nature that it cannot be controlled. The reason is that during a period of currency inflation, prices rise in advance of and in anticipation of inflation. Every wise seller will sell at prices which he thinks will prevail when he must replace his stock of raw materials at the higher prices. For this reason, also, consumers experience great difficulty in finding the purchasing power with which to buy the goods under conditions of steadily rising prices and constantly complain about the scarcity of money. Thus, there is always present a constant tendency for prices to collapse unless new money is fed into the machine. If at any time a move should be made to stop inflation or to "control" it, sellers begin to unload rapidly at prevailing prices because they know that the turn has come and that they could not ask more and get it. Other sellers become frightened, cancel orders for raw materials, and dump their finished products as rapidly as possible in order to put their business in a liquid position. Buyers stop buying because they know that prices will not rise any higher and will probably decline. Their reluctance to purchase combined with the sellers' anxiety to sell, precipitates a general liquidation, and the country finds itself in the grip of deflation and a business recession. "Controlled inflation" is a myth. It never has been controlled and it cannot be controlled. Its nature makes control impossible.

Many inflationists, quite clearly, do not understand that the alternative to the rise in prices resulting from currency inflation is a sound rise in prices based upon increased productive activity. To oppose inflation does not mean that one cannot support or advocate with consistency a sound rise in the price level. The rise resulting from inflation is due to the reluctance of sellers to sell, to fearful and hasty consumer buying; and it leads ultimately to a price

collapse. The "sound" rise in the price level is due to increased purchasing based upon the confidence growing out of a genuine increase in people's incomes.

Inflationists also urge that currency inflation be used to advance prices to the so-called "debt-level," that is, to the price level at which most of our debts were presumably incurred. Ordinarily this is supposed to mean the price level of 1926. The argument assumes that debtors and creditors can be separated into distinct groups; whereas most individuals, corporations, and governments are both debtors and creditors. It assumes that the debtors were the chief losers in the depression and that creditors did not suffer severely; whereas, in fact, creditors have suffered tremendously. It assumes that with a rise in prices resulting from inflation, the additional currency will, through some mysterious means never explained, seek out the worthy debtors, climb into their pockets, and enable them to pay off their wicked creditors; whereas, as a matter of fact, such money will find its way into the hands of property owners, speculators, and profit-makers who have it in their power to take advantage of the rising prices. The great mass of people, who have been injured during a period of falling prices, will be injured again during a period of rising prices resulting from inflation. The inflationist also forgets that many creditors have taken their losses—they have written them off. How can justice be done them? In a similar manner, many debtors have lost their property and now have nothing that will appreciate in value as inflation takes place. How can justice be done them? The idea that a restoration of the price level to the so-called "debt level" will bring justice assumes that what has been lost can be restored to the original owner. The only possible way to enable debtors to pay their creditors is by increasing employment, wages and salaries.

Correct Theory of Devaluation

The inflationist is impliedly attempting to find a way to penalize the thrifty saver, who, unlike the miser, has permitted others to use his savings. It is not his fault that debtors are experiencing difficulties in paying their debts, and from no standpoint should he be compelled to bear the brunt of the special disorders resulting from forces for which he is in no way responsible. To attempt to aid debtors as against creditors is to make a farce out of prudent living. Both classes should be helped; but the way of such help lies along the path of sound business recovery and not along the road of the unsound rise in prices generated by inflation.

Devaluation is confused with currency inflation. Devaluation is currency debasement. If the weight of our standard monetary unit were cut in half, all holders of gold would have twice as many dollars, but all bank deposits would remain unchanged. Since about 90 per cent. of all exchanges are normally effected by means of deposit currency, it should be clear that at the outset 90 per cent. of the media of exchange remains unchanged by currency devaluation. Nothing in the act of currency devaluation would change the size of your bank deposit and mine. The deposits would still call for the same number of gold dollars although the dollars would weigh just half as much as they do now. Only the holders of gold would gain—the government, the Federal reserve banks, the gold miners, the gold exporters, those with gold balances abroad, and the gold hoarders. Should the government profit in this manner at the expense of the people? Should the reserve banks have their gold holdings doubled in dollar value when their supply of gold now is almost as large as they have ever held in their history and yet cannot use it? Is there any reason why gold miners, gold hoarders and those who exported gold should have the dollar value of their gold doubled?

Devaluation Opens New Loopholes of Danger

No sound arguments can be advanced in behalf of devaluation. We hold all the gold we need—almost as much as we have ever held in our history—$4,323,000,000 on November 8 as against the peak of $4,995,000,000 in August, 1931. We can have a price level higher than any we have had in our history on the basis of the gold we hold. In May, 1920, when our price level reached the peak of 247 on the basis of 1913 as 100, we had only $2,856,000,000 gold. The problem is to find a way to get more money into circulation; it is not a question of the scarcity of gold or of money. Lessening the number of grains of gold in the dollar is not necessary to solve the problem. It will merely cause new economic maladjustments and will give gold holders purchasing power at the expense of others. Money goes into circulation as business activity increases, and it can go into circulation soundly in no other manner.

But one fears that this is not all of the picture today. Once a government embarks upon a monetary policy designed to depreciate its currency with the expectation that the gold standard will ultimately be devaluated, there develops a certain psychology among the people and in the highly attuned markets which makes it increasingly difficult to return a currency to the old par without experiencing something of a shock. This factor is difficult to weigh with accuracy; but it presents a genuine problem. It is a general awareness by economists of this problem that makes many of them doubtful whether it is wise to return to the old par despite the fact that we hold ample gold. On the one hand, if we go back to the old par we may experience a temporary psychological shock of more or less significance; on the other, if we do not return to this par but adopt a new one, we find ourselves with new mint pars in foreign exchange and with permanently changed relations in our international financial affairs.

Not long ago the President stated that if, in his

experimentation, he found he had made the wrong move he would try a new one. This statement seemed to elicit popular support. But one thing not generally recognized is that once a country embarks upon an unsound monetary policy it cannot make a new move as easily as changes might be made in other reform programs. It is as if one were driving his car up a narrow road flanked by steep precipices and suddenly finds he has taken the wrong road. It is not possible to turn around without disastrous consequences, and backing down will be a long and tedious process with the constant possibility of real danger. In all probability, one may find it best to turn off to the first available side road which leads in the proper direction; and although this may not lead to the smooth, well-traveled road which we might have traveled, it may lead us in the proper general direction, and in years to come we may arrive at our destination. So it is with monetary policy. We are clearly on the wrong road. The question is whether to back down or turn off on the side road of devaluation. It should never have been necessary for us to have this problem. We have accomplished nothing by traveling this wrong road, and now all we can do is make the best of an unhappy situation forced upon us by the fact that unsound money men caught the ear of the President at the fork of the road and sent him in the wrong direction.

Speedy Return to Gold Standard to Restore Confidence

In a similar manner, no sound arguments can be advanced in behalf of bimetallism, or of "doing something for silver". From a monetary standpoint, what we need, above all, to relieve business of its feeling of uncertainty is a speedy return to a gold standard in some form, and I would suggest the gold bullion standard, supplemented by provisions for an international clearance of our international transactions through the Bank of International Settlements at Basle. Such a system would solve the problem of gold hoarding, it would minimize unnecessary shipments of gold across the ocean, it would restore confidence, it would cause a return of capital which has flown to foreign countries, and it would prepare the way for a sound business recovery.

Purchasing gold abroad on the assumption that it will raise our price level is the most amazing and disconcerting thing of the sort ever undertaken by any country. We are witnessing the spectacle of the United States selling our dollars in foreign markets in an effort to drive down their value, we are seeing the government carrying out a gold policy recommended by that great speculator, Jay Gould, when he recommended to President Grant in 1869, that the government purchase gold—Gould's purpose being to increase the profits of the gold speculators; we are seeing government bond prices falling, the flight of capital to foreign markets, and the demoralization of our foreign exchanges; and we are seeing the government carrying on these foolish operations through the R. F. C., rather than carrying out its policies of control through the properly constituted and experienced Federal Reserve authorities. The President is thoroughly misguided in the matter, for buying gold abroad cannot affect our price level appreciably. We do not have a free gold market, as we had during the greenback period, when buyers and sellers could pit their judgment against each other as to what the future of the price level would most likely be. Such a market naturally made the premium on gold conform rather closely to the depreciation of the currency as measured by the rising price level. But today merely buying gold in a foreign market does not create a condition which links the price of gold to our domestic price level. We are merely buying gold and holding it. We are not selling it. The gold is not entering our currency circulation, and, therefore, cannot affect it. And if the gold were imported, it cannot enter circulation under our present laws, but can only be added to our bank reserves where it will have no effect upon circulation since our banks have surplus reserves now. It is important to notice that when our price of gold remained unchanged at $20.67 per fine ounce, our price level rose, and that since the price of gold has been raised from $20.67 to $33.00. the price level has not risen appreciably.

Today gold is merely a commodity, like thousands of other commodities in the markets of the world; and the price level is not determined by the price of any one commodity, but by the price of all. There probably is some psychological reaction in this country in the direction of rising prices, due to a widespread assumption that there is some connection between such gold purchases, but this reaction cannot be measured or forecast with any accuracy; and in the end the public will learn the truth, and the plan must collapse with the real possibility that it may bring in its trail chaos in foreign exchange and in our monetary system.

The "New Deal" and Federal Public Debt

Another important question before the country is whether the program of the New Deal is sound economically, or whether, as a good many are beginning to believe, the cart is before the horse, in so far as the behavior of prices and purchasing power is concerned. It is, of course, not possible to generalize with satisfaction and accuracy regarding such a far-reaching and complicated program. It seems clearly established in economics, however, that any aid of a sound and permanent nature which the government wishes to extend in an effort to hasten recovery must come in such a manner that it will make it profitable for producers to increase or renew their activities. A well-conceived, and properly-administered program of public construction certainly points in this direction. Such a program would create a demand for services and raw materials and might, if extensive enough, be sufficient to start the upward spiral.

The big problem now, however, is the fact that this program, combined with the others of the New Deal, has caused the Federal public debt to rise to fabulous heights. Much could have been said in behalf of a program for public construction at the outset, and if carried on in a thorough manner and without the other frills of the New Deal; but with the debt mounting, it seems impossible now to argue for anything that involves increase in public expenditures. Our debt burden, combined with our monetary policies, presents us with problems from which we cannot free ourselves for years and years to come. A reliable criterion by which to judge the present governmental program is whether the various plans instituted tend to make it more profitable for employers to renew or extend their operations and thereby increase employment and consuming purchasing power. Every other plan to increase purchasing power, except where the government puts people to work directly, is unsound and unworkable.

Child Labor, Minimum Wages and Agriculture

The steps taken in behalf of minimum wages and child labor are great advances. The same may be said in behalf of curbing unhealthy competition and industrial disputes; in the cleaning up of banking, and in the pressure being brought on other corporate managements to run their businesses in the interests of the greater good. Certainly great gains have been made in these directions. But in so far as the NRA causes or permits prices to rise in a manner that does not *result* from increased purchasing power flowing from increased employment and increased productive activity, it will fail. And if the government undertakes to engage in price fixing to any great extent, it will soon find itself deeply involved. Any government should be wise enough to avoid falling into this well-known pitfall.

The agricultural allotment schemes are neither workable nor defensible from an economic standpoint. It is popular to say today that there is too much production. This is only a half truth. The only way standards of living can be raised is through an increased production and consequent increased consumption of goods. At any time there can be too much production in particular lines of commodities, considering the nature of the market. But it seems unquestionably true that it is not less total production, but a greater variety of production, that is needed. It is not general overproduction but maldistribution of income, blocking of trade channels, bad banking practices, unfair systems of taxation, inefficient marketing machinery, excessive installment purchasing, inadequate control of credit, and wars that lie at the bottom of our present problems. The Department of Agriculture should have as its central purpose, not the curbing of production, but the development of a great variety of products.

Although the government undoubtedly has accomplished something in banking reform, it has failed to go to the root of the trouble. The major commercial banking problems will not be solved until all commercial banks and trust companies are made national banks, capital requirements raised, branch banking instituted on a larger scale and under the direction of the Federal Reserve banks, commercial banks recognized as public utilities in the finest sense of the term and made to run in the interests of the depositors and the general public as are the Federal Reserve banks, and until the Federal Reserve System is reorganized in a manner that will insure a better control of credit. The present law providing for the insurance of bank deposits fails to go to the bottom of the problem and should be revised.

The big immediate problem is currency. Perhaps above all else it is standing in the way of recovery. We must return to the gold or gold bullion standard at once at the old or at a new par. The reserves are sufficient to enable us to return to the old par if we wish to risk a possible psychological shock. I doubt seriously if there would be an important adverse reaction and certainly nothing like a collapse in prices. As a matter of fact, there seems to be good reason for supposing that such a step should do more to insure prosperity than almost any single thing that could be done. There is no really important reason, aside from the possible temporary psychological factor, why our price level should be depressed. On the contrary, the way should be cleared for a steady upward swing in business and in the price level; and this upward swing would be based upon a sound revival in productive activities and a well-grounded increase in consumer purchasing power.

Lime Industry 1932

Sales of lime in 1933 by producers in the U. S. amounted to 2,224,000 short tons, valued at $14,006,000, according to preliminary figures furnished by lime manufacturers, an increase of 13.5 per cent. in quantity and 13.8 per cent. in value compared with sales of 1,959,990 tons valued at $12,302,231 in 1932; and follows a decrease of 28 per cent. in quantity and 34 per cent. in value in 1932 compared with 1931. Average unit value per ton in 1933 was $6.29; in 1932, $6.28. Total sales of lime in 1933 include 822,000 tons of hydrated lime valued at $5,512,000, a decrease of 3.6 per cent. in quantity with increase of 2.6 per cent. in value as compared with 1932 (852,251 tons valued at $5,370,273). The average value per ton of hydrated lime in 1933 was $6.71; in 1932 it was $6.30, according to the Bureau of Mines.

Producers, even in the same districts, reported great variations in demand for all classes of lime. In general, demand for building lime was small with prices low until the last quarter of the year when both demand and prices increased somewhat. Better realizations were obtained for hydrated lime than for quick lime. Chemical lime (which for statistical purposes includes metallurgical and refractory lime), influenced largely by activity in iron and steel and the chemical industries, was in good demand in some regions but demand was small in markets where chemical manufactures were less active.

Sales of lime in 1933 for construction are estimated at 507,000 tons compared with 596,825 tons in 1932, a decrease of 15 per cent. This followed a decrease of 37 per cent. in 1932 from the 1931 production.

RESEARCH has shown that in many cases the Amyl group reaches the peak of desirable chemical properties. For this reason the Sharples Solvents Corporation has concentrated all of its efforts on the production of pure Amyl compounds. YOUR process problem may possibly be solved quickly and economically by the use of one or more of the following Sharples Amyl Compounds:

Pentasol (Pure Amyl Alcohol)	Amyl Mercaptan	Diethyl Carbinol
Pent-acetate	Diamyl Sulphide	Dimethyl Ethyl Carbinol
Pentaphen (Para-Tertiary Amyl Phenol)	Amyl Benzene	Mixed Amyl Chlorides
Monoamylamine	Normal Butyl Carbinol	Normal Amyl Chlorides
Diamylamine	Iso-Butyl Carbinol	Amylene Dichloride
Triamylamine	Secondary Butyl Carbinol	Diamylene
	Methyl Propyl Carbinol	Diamyl Ether

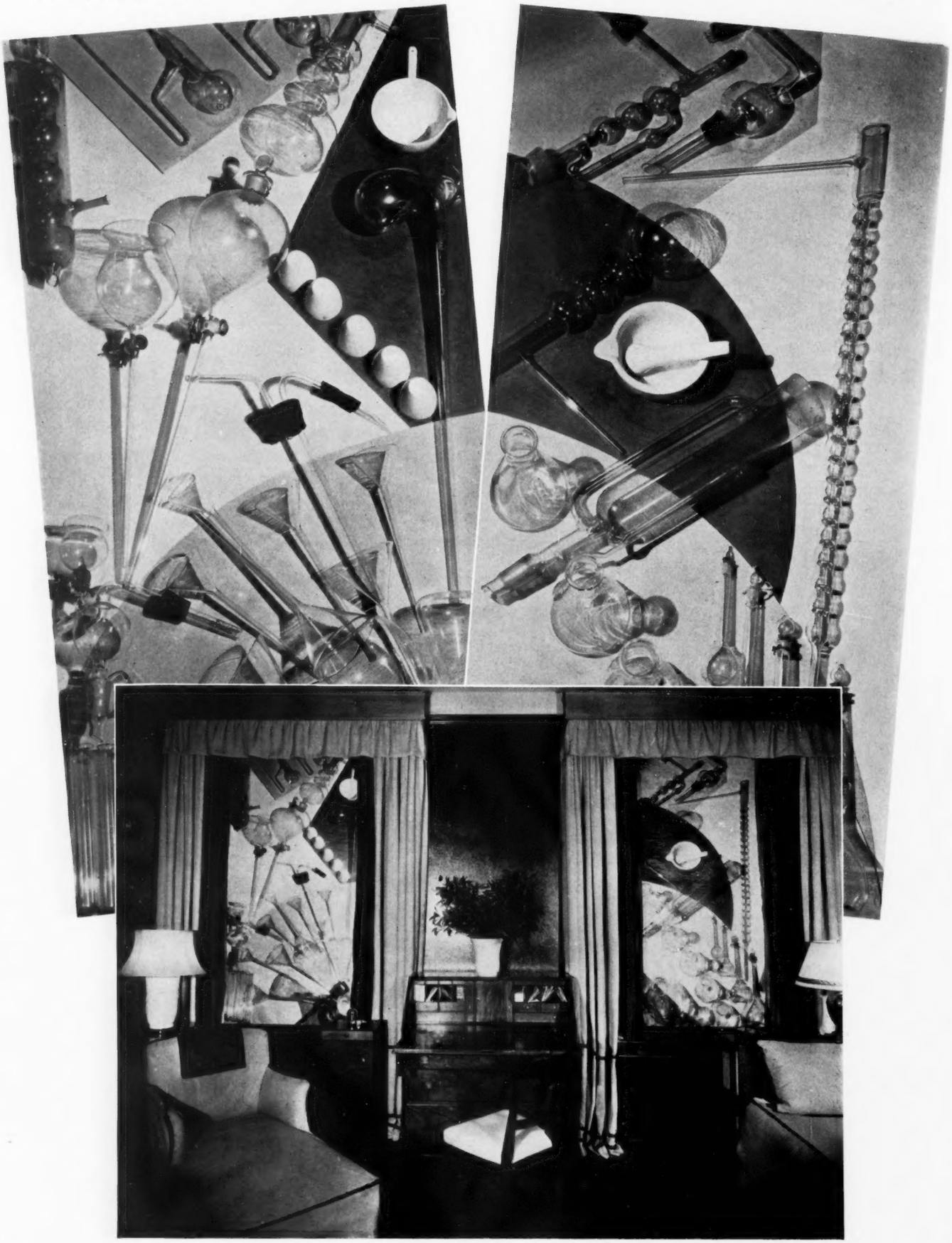
The Sharples research and development laboratories are at your constant disposal. Don't hesitate to consult with us.

THE SHARPLES SOLVENTS CORP., PHILADELPHIA

A novel attainment in interior decorating is the background of this study-bedroom in the home of William M. Grosvenor, Jr., recently married to Rose Hobart. Joseph Mullen, the decorator, chose tints of low nigger brown and orange for the color scheme, and the most interesting feature is, of course, the shades at the windows, shown below, which inject an atmosphere for deep chemical reflection. The photographs were taken by Stella F. Simon and blown up on Eastman Kodak's photographic linen.

CHEMICAL

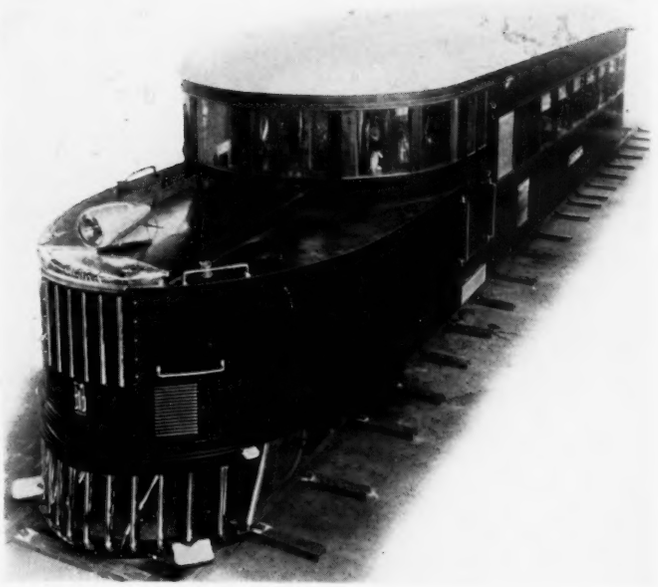
The Photographic Record



NEWS REEL

of Our Chemical Activities

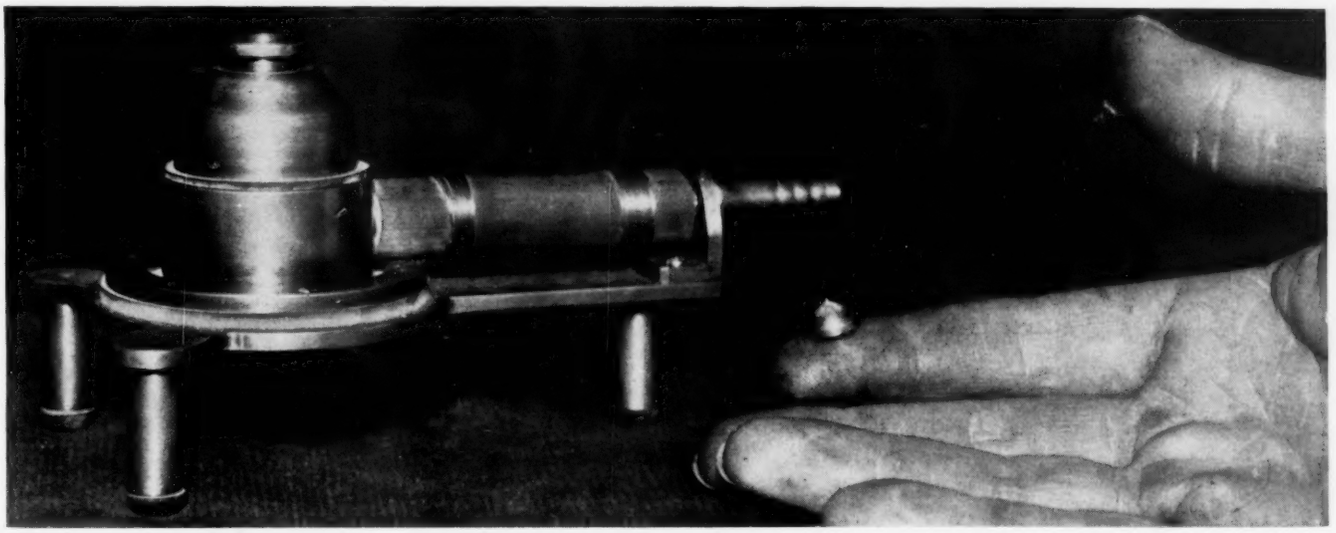
Embodying radical changes in the design for rail equipment and holding forth large possibilities for the consumption of aluminum and its alloys, this train has been produced by Clark Equipment Co. in streamline design, with body of aluminum and safety glass windows. Temperature is automatically controlled by thermostat, air being preheated by hot water radiator before entering air conditioning plant.



Two of the one million lucky pieces made of aluminum alloy which will be given to visitors to the first streamlined, aluminum alloy train of the Union Pacific Line, now on exhibition. Lucky pieces are of same material as the train and five tons of the alloy were required to make the million pieces.

An unusual piece of sculpture, executed by Dr. J. A. Bertsch, Research Department, Monsanto, entirely from memory and without models. Sketch represents an artistic conception of chemical labor, the large autoclave symbolizing the tremendous force of powers enclosed therein.

Courtesy Monsanto



A centrifugal which attracted considerable attention at the recent Chemical Exposition, is capable of operating at a speed of 20,000 revolutions per second, representing a maximum centrifugal force of 7,600,000 times the force of gravity, and a peripheral speed of 1390 miles per hour. Designed for Sharples Specialty Company, and said to be the world's fastest rotation speed for any man-made article, without qualification as to type or category.

Monsanto

THE basic chemicals you select from the Monsanto list give satisfaction because they are made in plants of the most advanced design under conditions that thoroughly safeguard quality.

The list of products for industry includes:

Chlorine	**Phthalic Anhydride**
Cresylic Acid	**Plasticizers**
Maleic Acid	**Resins**
Metanitrochlorbenzene	**Salicylic Acid**
Muriatic Acid	**Solvents**
Nitric Acid	**Tricresyl Phosphate**
Phenol	**Triphenyl Phosphate**

Manufactured by

Monsanto Chemical Company
ST. LOUIS, U.S.A.

New York • Boston • Chicago • San Francisco • Montreal • London

CHEMICALS OF QUALITY
Monsanto
ST. LOUIS, U.S.A.

Chemicals

Chemical Consumption

A digest of new products and processes in process industries for the user of chemicals.

Silicates of Soda for Ceramics

By J. G. Vail*
Philadelphia Quartz Company

Commercial sodium silicates may be divided into two classes, colloidal and crystalline. Each class includes materials differing in physical form, water content, and chemical composition. Colloidal silicates vary in ratio from Na_2O:1.6 SiO_2 to Na_2O:4 SiO_2. It is possible to make silicates with even higher proportions of silica, but these are not on the market.

Colloidal silicates usually are sold in solution at a concentration which is practically the maximum at which they can be handled. If the concentration becomes too high, the viscosity is very great and there is a tendency to form jellies. The differences in properties in the silicates readily can be shown by taking two such concentrated solutions. One of these has a ratio of Na_2O:1.6 SiO_2, contains approximately 62.5 per cent. solids, and has a specific gravity of 1.9. The other has approximately 32.5 per cent. of Na_2O:3.9 SiO_2, with a specific gravity of about 1.3.

The first is extremely tacky and tough, while the second is not at all sticky and breaks apart readily.[1] The latter is a liquid and flows under its own weight but possesses elasticity which may be shown by forming it in a ball and bouncing. The other silicate does not possess this property. Intermediate silicates have properties between these two extremes.

The crystalline silicates are comparatively recent and open an entirely new field. They are definite chemical compounds with definite and distinct crystal form. So far they have found very little use in the ceramic field.

If a very small amount of sodium silicate solution is mixed thoroughly with a cake of wet clay, there is a remarkable increase in fluidity. For example, filter cakes containing 20 per cent. of water when mixed with approximately .1 per cent silicate and .1 per cent. carbonate, based on the weight of the clay, are reduced to fluid slip which can be pumped through a 1-in. pipe. Of course, other alkalies can be used for this purpose, but silicate is particularly good because the silica acts as a buffer for the Na_2O. As a result, there is very little change of pH over a wide range of concentration and there is less danger of having an excess or of failing to get enough deflocculant present. Not only does the pH in any given silicate solution vary comparatively little with concentration but it is possible by using different silicates to have the same total alkali present at very different pH levels.

The deflocculation of clay by silicate is used for two purposes in the ceramic industry. The first of these is to remove impurities by sedimentation. The silicate not only deflocculates the clay, but it flocculates and precipitates pyrites and other sulfides.[2] Schurecht[3] found that a relative viscosity of 1.16 was satisfactory for washing clay. "If no alkalides are used this viscosity is reached when the slip contains about 13 per cent. of clay." When enough sodium silicate to produce minimum viscosity is added, this viscosity is not reached until the slip contains about 20.5 per cent. clay. At the given viscosity about 58 per cent. more clay per volume of slip can be treated by using sodium silicate than without using any alkalies. With sodium hydroxide the figures are 20 and 54 per cent., respectively, and with sodium carbonate, 20 and 50 per cent. This process is used in the ceramic industry to remove objectionable materials, but conversely in the mineral industry to increase the yield of values in sedimentation and flotation processes.

Some deflocculant is necessary in the casting of many heavy bodies and silicate appears to be particularly good for this purpose. Not only does it give a high fluidity, with highly concentrated slips over a wider range of concentration than either carbonate or caustic, but it reacts also, more rapidly with calcium sulfate, so that when the slip comes in contact with the plaster of Paris mold, the clay is flocculated and there is less chance for segregation.

Schurecht[3], for example, found that on a given Georgia kaolin in a 50 per cent. slip, the concentration of Na_2O:3.1 SiO_2 could vary between 0.16 and 5.0 per cent. and retain fluidity. With sodium hydroxide, the limits were 0.08 to 1.00 per cent., and with sodium carbonate 0.30 to 1.00 per cent. All percentages are based on the weight of dry clay, as this relation is much more important than the concentration of the solution. The minimum viscosities were 1.88 for silicate, 1.93 for caustic, and 3.48 for carbonate at concentrations of .22, .18, and .70 per cent., re-

*Abstract of speech presented at recent meeting of Ceramic Association of New Jersey, Trenton, N. J.

spectively. There is less shrinkage on drying with silicate. The modulus of rupture is increased over 250 per cent.

In electrical casting, Kleeman[4] found that he was only able to secure 30 per cent. of solids in a porcelain slip. This gave a creamy layer which was unsatisfactory. By adding from 0.1 to 0.3 per cent. of silicate, it was possible to increase the slip concentration to 60 per cent. and still have the same fluidity. Castings deposited from this slip were solid and satisfactory. McDowell[5] also found that sodium silicate is more effective than other alkaline materials. He studied a series of the silicates and states that those "high in silica were the most potent in their effect on the rate of flow for a given amount of Na_2O."

Silicate alone is said to yield "stringy" slips, but some companies use it without any trouble. Usually a mixture of silicate (Na_2O:3.3 SiO_2) and sal soda is preferred. McDowell has suggested 80 per cent. of silicate and 20 per cent. of carbonate, but in practice as high as 50 per cent. of carbonate is used. The total deflocculant should be approximately 0.2 per cent. on the weight of the clay.

Now consider the sodium silicate glass, which differs only from ordinary window glass in that it contains no calcium and, therefore, can be dissolved in water under special conditions. In order to make a glass of the composition Na_2O:3.3 SiO_2, a temperature of at least 1150 deg. C. is required to completely fuse the sand in the soda ash. A temperature of 1350 deg. C. gives better results. After the silicate is once made, however, it liquefies at a much lower temperature, 840 deg. C. for this glass. This has led to the use of powdered glass of this ratio in enamels.

Since the silicate is more expensive than the ingredients it replaces, it has only been used commercially in enamels hard to make, or in which special effects are desired. It has been especially valuable in acid-proof enamels. Andrews[6] has found that at least 55 per cent. of silica must be present in sodium-lead-silica enamels to obtain acid resistance and at least 61 per cent. in sodium-boric acid-silica enamels. It is hard to melt such enamels as ordinarily made, but if sodium silicate is used as the source of the silica, it is considerably easier. Manson[7] showed that frit prepared in the ordinary way contained free silica and, therefore, was less acid resistant than the silica content would indicate. In addition, he found that enamel made with sodium silicate flowed more freely and that the time required for smelting the frit was less than when silica and soda ash were used in the batch.

The last point is an important factor and a good reason for using sodium silicate. Not only is there a saving in heat but often sufficient saving on the opacifier, which is relatively expensive, to largely or entirely offset the cost of the silicate. Many opacifiers are volatile and may be lost by vaporization or sublimation from the batch. Others are non-volatile but dissolve in the glass so that they act no longer as diffusing agents, and more must be used to give the required effect. While there are no figures to prove it, theoretically the enamel in which the silica is completely combined should have greater resistance to thermal shock than one in which this is not true. Sodium silicate usually has been used in the dry process enamels, but it can be and is employed in the wet process. There is a possibility that unfritted enamels can be made with it.

Some may be more interested in glazes than in enamels and here again sodium silicate is of value. Littlefield[8] prepared a blue enamel, using sodium silicate glass, that was useful at a comparatively low temperature (Cone 9). The best results were obtained with a mixture of the composition

$$\left.\begin{matrix}.8\ Na_2O \\ .2\ CaO\end{matrix}\right\} .25\ Al_2O_3 — 3.75\ SiO_2$$

to which 5.5 per cent. of copper carbonate was added. Increasing the Al_2O_3—to more than .4 affected the color, while if it were decreased below the amount given, the glass devitrified. If the lime were decreased to .35, the glaze became green.

McVay and Backer,[10] at the University of Alabama, have been working on unfritted alkaline glazes, and have found that these are particularly good on high silica bodies. The glazes are milled in the usual manner and applied by dipping or by spraying. The ware was placed in saggars and fired in a gas fired kiln for 8 to 10 hours. When fired to Cone 04, a blue green glaze with metallic lustre was obtained from

.5 Na_2O	2.0 SiO_2
.3 ZnO	.1 $SnoO_2$
.2 PbO	

with 7.12 per cent. basic copper carbonate. Replacing .05 PbO with CoO gave a beautiful dark blue with a metallic lustre. If lime was used in place of lead in this glaze, a glossy opaque blue resulted.

The entire range of colloidal silicates is used in various cements. The more alkaline colloidal silicates are employed in stove cements where a sticky mixture is desired, where the cement must remain plastic in a closed container over a period of many months, and where it is not necessary to have an extremely refractory mixture. For high temperature cements, more silicious silicates of various types are used. Although the melting point of Na_2O:3.3 SiO_2 is considerably lower than that of Na_2O:2 SiO_2, it is a more satisfactory ingredient for a refractory cement because it has less fluxing action due to the lower Na_2O content. The most silicious silicate to solution is used in acid-proof cements.

If a dry mixture cement containing readily soluble sodium silicates is used, or if a wet mixture is made and utilized immediately, one of the big problems is eliminated. Some clays react with silicate at ordinary temperatures over a period of time, and certain forms of calcium carbonate are very reactive, particularly with a silicate of the ratio of Na_2O:2 SiO_2. Obviously, if a mixture is packed in a can and such a reaction takes place, the customer getting a piece of rocky material will be dissatisfied. Therefore, it is necessary to test the ingredients of cements very carefully. Small amounts of impurities in the ingredients, or even the presence of acid materials on the can itself, may cause setting.

Some clays do not react with sodium silicate at ordinary temperatures but do so when heated. For example, one such clay rendered 50 per cent. of the Na_2O insoluble when baked but did not react over a period of several weeks at room temperature.

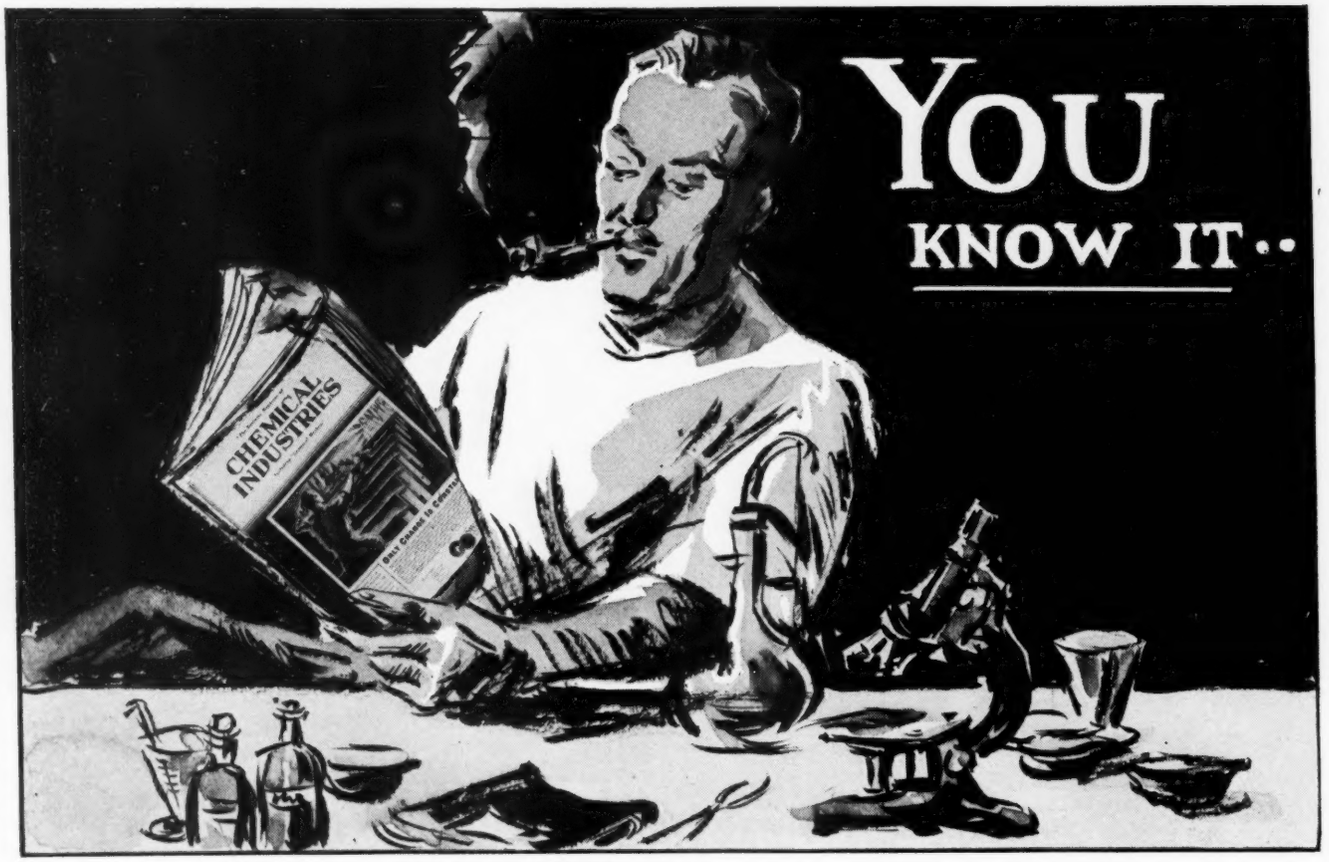
Reactions such as these are used in the manufacture of abrasive wheels. Silicate is mixed with clay or other reactive material and the abrasive grains. Then, the mixture is tamped into molds, dried and baked. For many purposes, the resulting product must be insoluble and some times other materials, such as zinc oxide, are added to decrease the solubility. The abrasive grains in the wheels are merely held together with a silicate cement.

1 J. G. Vail, Ind. Eng. Chem. 11, 1029-32 (1919).
2 H. Kohl, Ber. deut. keram. Ges. 3, 64-77 (1922).
3 H. G. Schurecht, Bur. Mines, Tech. Paper 281 (1922).
4 R. D. Kleeman, Phys. Rev. 20, 272-9 (1922).
5 S. J. McDowell, J. Am. Ceram. Soc. 10, 225-37 (1927).
6 A. I. Andrews, J. Am. Ceram. Soc. 13, 411-26 (1930).
7 M. E. Manson, J. Am. Ceram. Soc. 14, 490-4 (1931).
8 E. Littlefield, J. Am. Ceram. Soc. 15, 269-70 (1932).
9 T. N. McVay and E. Backer, unpublished.

Soaps

Floating Soaps

The chief objective in the manufacture of floating soaps is to reduce the specific gravity; various methods being used to accomplish this purpose. An obvious way in which this can be brought about—viz: the inclusion of cork—was patented 50 years ago; nowadays various alcohols, including the new synthetic fatty alcohols are used. Incorporating a gas in the soap, for the purpose of lightening it, can be achieved by the interaction of acid and carbonates or the use of persulfates and peroxides. A recent development envelops the use of metal powders. Aluminum powder has been found to give more satisfactory results, and both a bleaching and lightening effect are obtained from the evolved hydrogen when the metal acts on the alkali present. From 20 to 30 gm. are used for 100 kgm. of soap. Sodium aluminate, which



but it may still be news to some

MOST industries in America using Phosphoric Acid are fully aware of the superior properties of the pure food grade, water white acid produced in great electric furnaces under the exclusive method developed by Swann Research.

Most industries using phosphates know that Swann Phosphates, made from Swann Acid as a base, under the close chemical control of Swann Research, are the finest phosphates that can be produced.

If you have not tested these Swann products, we cordially invite you to write or telephone our nearest office for complete data.

PARTIAL LIST OF SWANN PRODUCTS

- Phosphoric Acid 75%
- Phosphoric Acid 50%
- Mono Sodium Phosphate
- Di Sodium Phosphate
- Tri Sodium Phosphate
- Sodium Acid Pyrophosphate
- Sodium Pyrophosphate
- Mono Ammonium Phosphate
- Di Ammonium Phosphate
- Mono Calcium Phosphate (H T Phosphate)
- Di Calcium Phosphate
- Tri Calcium Phosphate

SWANN RESEARCH — TO FIND A BETTER WAY

SWANN CHEMICAL COMPANY
Birmingham

Division of THE SWANN CORPORATION

District Offices: NEW YORK, CHARLOTTE, CLEVELAND, DALLAS, SAINT LOUIS

is the resultant product, is neutral, and has no effect on the lathering or appearance. The hydrogen bubbles are so finely distributed that they are quite invisible.

Soap Preservatives

Sodium thiosulfate or sulfite as preservatives for soap have proven highly effective, but have certain disadvantages. The sulfite, only sparingly soluble in water, must be incorporated in the soap in the form of a very fine powder, though even then it is apt to form lumps, and impart an unpleasant odor. Thiosulfate, free from these defects, is readily soluble in water and may be incorporated as a concentrated solution. It does not affect the odor of the soap, nor its lathering, as the amount added does not exceed 0.5 per cent. Its chief difficulty is that it readily parts with an atom of sulfur, and therefore reduces to sulfite. This happens under many conditions: in solution; in the presence of air, acid, etc. Even the small amount of organic acid in ordinary perfumes is sufficient to upset its stability. Metals have a similar effect, especially iron or copper, as have also metallic salts. Bismuth nitrate in place of sodium thiosulfate is recommended, unless the latter is dealt with in wooden apparatus.

New Detergent

For cleaning and disinfecting lavatory pans, sinks, etc., a mixture of sodium bisulfate with ferric sulfate gives good results. The ingredients may be mixed as such, or a mixture in suitable proportions of anhydrous sodium sulfate and ferric oxide or hydroxide may be treated with sulfuric acid to yield a mixture of sodium bisulfate with five to 30 per cent. of ferric sulfate and free from excess sulfuric acid.

Paper

Lignin Extraction by Dioxane

Attention has been focused during the past year on the possibility of elaborating a process for the removal of lignin from wood by a solvent extraction process. Ethylene glycol and di-chlorhydrin are effective solvents, but cyclic ether dioxane appears a more promising material and is the subject of discussion in German Patent 581,806.

While ethylene glycol enters into reaction with the lignin with the formation of an acetal-like body, dioxane functions purely as a solvent. By warming wood for several hours in dioxane at 90° C. the lignin content is practically completely removed. The cellulose remaining is filtered and washed with acetone. The residue on the distillation of the dioxane consists of lignin containing a proportion of rosin as impurity, but the rosin can be removed by extraction with benzol, while purification of the lignin from hemicelluloses and sugar can be effected by a final washing with water. The presence of a small amount of acid is advantageous during the extraction of the lignin, a fact which seems to argue that there may be some sort of combination between the lignin and the cellulose, particularly as hydrochloric acid is by far and away the best additive, so that it is not simply a matter of hydrogen ion action. A similar process uses mixtures such as methyl glycol acetate and butanol.

The pale brown lignin obtained by both processes is soluble in dioxane, acetone, and certain other organic solvents, but not in ether and benzol. It possesses phenolic properties which it loses by digestion with strong hydrochloric acid and can be purified by solution in caustic alkali and reprecipitation with carbon dioxide.

A technical drawback to the process is that although the cellulose produced is of very good appearance, it is rather low in alpha cellulose content, and is thus hardly suitable for the viscose silk or transparent paper industries. An advantage it possesses over the sulfite process is that it is applicable to all kinds of wood, even beech and pine. The process possesses a further interesting application as it enables the isolation of the hitherto unknown coloring matter of ebony. The lignin is extracted with dioxane, the residual cellulose removed by hydrolysis with 72 per cent. sulfuric acid, and the black coloring matter remaining possesses similarities in constitution and properties with lignin itself.

Increasing Cellulose Production

Pretreatment of wood chips before the boiling proper is the subject of a patent which improves the manufacture of cellulose. After the digester is charged the raw chips are treated with solutions of acetates or phosphates under boiling for 1 to 3 hours at a temperature of approximately 110° C. and a pressure of 4 to 8 atmospheres. The solution is then drawn off and without washing the digester is filled with acid or alkaline boiling liquid with which the boiling proper is carried out at a higher final temperature than is usually employed—up to 170° C. The pretreatment solutions may contain approximately 6 grams of acetate or 10 to 20 grams of alkaline sodium phosphate per liter. The acetate solutions may be alkaline, neutral, or acid, corresponding to the kind of boiling liquid to be employed subsequently. The solution can be used repeatedly after adding a sufficient amount of the active substance to replace that absorbed by the chips. The advantages claimed for the procedure are a reduction of the total boiling time of from 2 to 3 hours, an increased output of cellulose, a uniform quality of the product, and complete prevention of the so-called black-cookings. The output of cellulose from coniferous wood varies between 48 and 52 per cent., the product having a tear length of 8000 to 9000 meters.

Moistureproof Paper

British Patent 392,023 describes how moistureproof opaque or transparent paper is made from a mixture of a cellulose ester or ether, a plasticizer, and a water-repellent agent, such as rubber, oils and waxes, then wet with a volatile solvent or solvent mixture and kneaded until a homogeneous paste is obtained. This is gently heated to volatilize the solvent and replace it by a precipitant, such as water, which is in turn removed by further heating. The mass is then cooled to a temperature less than 25 deg. C. with constant kneading until it falls to a powder, of which 5 to 15 per cent. (on the weight of the furnish) is incorporated with pulp in the beater and the resulting sheet hot-calendered. Alternatively the powder may be melted, optionally with the addition of small quantities of high boiling solvents, and used as an impregnating solution.

Metals and Alloys

New Case-hardening Process

Known as "Durapid," this process differs from other methods in that the parts to be hardened are dipped directly into a bath of a special mixture in the form of a thin paste, and are put into the furnace without any packing. When removed from the furnace the pieces are plunged into an oil bath where they are cooled off. While this process is applicable to box-hardening in the usual manner, a sealed muffle or retort, offering protection from the oxygen in the air and the combustion gas from the fuel, is recommended to obtain the best results. Its most outstanding advantage is the short time necessary for the parts to remain in the carburizing furnace, the same depth of penetration being obtained in considerably less time than is required by ordinary methods. With plain carbon steels the carburizing time to obtain a depth of 1 mm. is from 60 to 80 minutes after the work has attained the furnace temperature. Steels of this type can be carburized at 930 to 940° C., while for alloy steels, such as nickel-chromium steel, temperatures of 880 to 900° C. are suitable.

Boron in Alloys

Tool alloys can be made of a greater proportion of a boride of a refractory metal such as tantalum, niobium or vanadium and an auxiliary metal of the iron group. In making the alloy, boron and the refractory metal in just sufficient or in slight excess of the quantity required to combine with the boron, after a thorough mixing in a ball mill, are placed in a tantalum crucible surrounded by tantalum powder inside a graphite crucible and heated in an evacuated electric furnace. The boride is ground and after degasification by heating *in vacuo* in an electric furnace is thoroughly mixed with a hydrogen reduced auxiliary metal, shaped under great pressure and finally heated *in vacuo*. All traces of embrittling gases are removed from the alloy by heating each of the components to a degasification temperature *in vacuo* before or after mixing with the other components.

Non-Corrosive Detergents

In a foreign specification mention is made that cleansing agents without action on aluminum, tin, or their alloys consist of preponderating quantities of alkaline alkali phosphates mixed with compounds of aluminum or tin capable of reacting in aqueous solutions with the phosphates in such proportions that one per cent. or stronger aqueous solutions do not attack aluminum or tin or their alloys at temperatures up to 90° C. Specified compounds are aluminum hydroxide, sulfate, and chloride, and stannous chloride; when aluminum sulfate is the compound more than 20 per cent., preferably 25 per cent. or more is used. For example, 250 gm. of crystalline aluminum sulfate is mixed with 750 gm. of crystalline trisodium phosphate, or 250 gm. of stannous chloride with 750 gm. of calcined trisodium phosphate, and made up as a 5 per cent. solution.

Patents—Metals

Alloy, resistant to halogen hydracids, for use in chemical apparatus. No. 1,939,890. H. Frischer, Berlin.

Ammonium chloride mixture, in coating high melting point metals with zinc or zinc alloy. No. 1,939,667. Henry Csanyi, N. Y. City.

Leather

Advantages of Phenol to Leather Trade

Saturated solutions are used for sterilizing raw hides against putrefactive organisms. A solution containing 99 per cent. water and one per cent. phenol is sufficient for mere sterilizing of hides, but if it is desired to preserve them for long periods before tanning, then stronger solutions should be used, but never over four per cent. phenol. It finds adaptation in controlling fermentation of tanning liquors, but should not, however, be used when plump leather is desired, except during final stages of the tanning process. Quantities from one part up to ten parts per 1000 will control fermentation of liquors.

For the purpose of preventing formation of molds on the surface of finished leather, the phenol solution should be swabbed or sprayed on the surface. Quantities used are from one part up to three parts per 1000. In deliming and bating hides and skins after the beamhouse process it is rarely used alone, but in a mixture with boric, sulfuric and other acids. Among other uses attributed to it are: As an antiseptic for leather finishes, keeping them sweet until ready for use; by manufacturers of commercial tanning bates; as preservation for some of the essential oils used in leather manufacture; in the manufacture of syntans, these products not usually being satisfactory tanning agents unless some phenol is added to their mixture; by manufacturers of oak bark and other fermentable vegetable tanning extracts to prevent such products from fermenting while in transit from producer to consumer, also added to such extracts during summer weather.

Fluoride Salt for Hide Curing

Unless hides are going straight into the lime-pits of a tannery they must be preserved, the simplest and probably best treatment being a "salting" with common salt, according to information divulged in *The Chemical Trade Journal*.

While sodium chloride, if properly used and applied to the goods before any putrefaction has set in, will do much to prevent many undesirable conditions accruing, many molds which produce colored spots and stains are not prevented from growing even by high concentrations of salt. Again the organisms which play the greatest part in the production of "red heat"—the halophils or salt-loving organisms—may even be added to the hides with the curing salt. Another obnoxious organism which may be carried by hides and skins, particularly those that are sun-dried, is the Bacillus anthracis. Although, by means of a special liming process, it is possible to destroy the anthrax bacillus, no satisfactory method of dealing with this infection during curing has been evolved. Further research however, indicates that the use of gaseous hydrogen sulfide might prove effective, but this method has not yet passed the laboratory stage.

Sodium chloride is comparatively expensive in some countries, and curers are often tempted to add adulterants such as sodium sulfate, a practice which is to be deprecated from the tanners' point of view. It has been shown, *inter alia*, that the addition of sodium fluoride or fluosilicate to the curing salt is a good method of keeping down mold growth and "red heat," and does not apparently injure the hides from the tanning standpoint.

High-class gelatine for culinary use or for confectionery is often made from the odd pieces of green goods discarded by the tanner after liming and unhairing. If preservatives or disinfectants containing, say, arsenic, or other poisoning substances have been used on the hides at any time, extreme care will have to be exercised to ensure that the amount of this poison which finds its way into the finished product is below the statutory limit, in the case of arsenic of 1/100th of a grain per pound of dry weight. Copper, lead, or zinc are also metals with which, from this viewpoint alone, it would not be advisable to treat hides. One per cent. of sodium fluoride or fluosilicate, in the salt used for curing hides, although quite satisfactory as regards skin for tanning, is probably not desirable in edible gelatine.

The question of the toxicity of fluorides is rather a vexed one. Very contradictory statements as to the amount of fluorine that can be ingested with impunity by human beings are to be found in the literature, but the consensus of opinion seems to be that only small quantities of this element should be allowed in foodstuffs for either human or animal consumption. Research has been carried out in order to determine how much fluoride remained in gelatine manufactured from hides treated with a curing salt containing compounds of this element. The results showed that with carefully manufactured high-grade gelatine the amount of fluorine that can be recovered from the finished article was of the same order whether or not the hides from which the production was made had been treated with fluorides. It is noteworthy that there are very few, if indeed any, authentic cases of poisoning or skin irritation arising from the handling or ingestion of fluorine compounds.

Textiles

Acetylated Cotton

As a result of acetylation of cotton, swelling of the fibre takes place, together with an increase in weight of not less than 22 per cent. without shrinkage in length. Low acetylated cotton yarns prepared in the manner governed by E. P. 280,493 have been registered as "Cotopa" (non-lustrous) and "Crestol" (lustrous). They possess the structure and strength of the original cotton yarn. As a result of conversion, the weight of the bleached yarn is increased, as stated, to not less than 22 per cent. and the yarn can be woven or knitted with no more difficulty than with ordinary cotton yarns.

No deterioration on storage occurs under normal conditions. Even storage at high temperatures does not appear to damage

the fibre. Crestol yarn may be boiled in neutral solutions without losing its lustre, strength, or resist properties, while for desizing the usual malt or diastatic desizing agents can be used with safety. For scouring, a good quality of soap must be used, guaranteed free from excess alkali.

Month's New Dyes

Pontacyl Violet 12B

An acid dyestuff of du Pont origin, which produces very bright bluish shades of violet. Recommended for use on wool and worsted yarn and piece goods, also on pure silk in an acid bath. Suitable for printing on wool. Acele, cotton and rayon effects are practically unstained; and combinations of wool and silk may be dyed to a uniform shade. Is fast to ammonia, ironing, rubbing, stoving and water spotting; shows good resistance to the effects of acid perspiration, steaming and cold water.

Rapidazol Black B

Stable dye of General Dyestuff line which comes in powder form. On vegetable and artificial fibres, and mixed fabrics of these fibres, it produces a fine and deep black of very good fastness to washing and boiling, of good fastness to chlorine, and fairly good fastness to light. Develops to a fast shade in rapid ageing and does not require acid treatment. Circular may be obtained from company.

Variamine Blue Salt FG

A new, readily soluble Fast Color Salt of the General Dyestuff line, of great importance for direct, discharge and resist printing. In combination with a large number of the Naphthol AS brands produces brighter and much greener blue shades. Of special interest for the printer since the principal combinations are clear white dischargeable or lend themselves well to the resist style and since the style on the suitable Naphthol Prepare produces bright, novel shades of blues and greens. Circular is issued by company.

Celliton Fast Black GN Powder

New black for acetate silk, dyed from a soap bath. This product of General Dyestuff possesses the greenish shade often demanded, combined with an exceptionally fine evening shade, which surpasses that of the G brand. Also possesses excellent affinity, with the result that a full black, at relatively low cost, is obtained after dyeing for one hour at 170° F. Not recommended for direct and discharge printing. Dyeing method found in pamphlet issued by company.

Patents—Textiles

Pine oil process with pigment for making colored filaments, films, yarn etc. No. 1,940,602. A. J. L. Moritz, to Amer. Enka Corp., N. Y. City.

Use of unsulfonated diazo-compounds of the benzene series, for producing fast tints on wool. No. 1,940,551. A. Landolt, to Ste of Chem. Ind. in Basle, Basel, Switz.

Patents—Miscellaneous

Cellulose

H_2O-acetone process for perfecting low denier filaments of cellulose. No. 1,941,204. Henry Dreyfus, London.

Sulfurous acid solution for reducing viscosity of cellulose fiber. No. 1,941,154. G. A. Richter, to Brown Co., Berlin, N. H.

Alkacyl-alkoxyalkacyl esters of cellulose. No. 1,940,710. Henry Dreyfus, London, Eng.

Phytosterol and fatty acids from raw tall oil soap, out of sulfate manufacture of cellulose. No. 1,940,372. Est. of H. Sandqvist, Kosta, Sweden.

Rubber

Accelerator for rubber-sulfur heating in vulcanization. No. 1,941,146. M. W. Harman, to The Rubber Service Labs., Akron, O.

For making dinitro-phenyl-benzothiazyl sulfides. No. 1,941,142. W. P. ter Horst, to The Rubber Service Labs., Akron, O.

Ethylene diamine with aldol treatment for retarding deterioration of rubber. No. 1,941,012. W. N. Jones, to B. F. Goodrich Co., Akron, O.

Methods of preserving rubber. Nos. 1,940,815-819. Applications from '28 to '32. W. L. Semon to B. F. Goodrich Co., Akron, O.

Methods of preserving rubber. No. 1,940,824. A. W. Sloan, to B. F. Goodrich Co., Akron, O.

Yellow and orange colored vulcanized rubber. No. 1,940,053. Hentrich, Hardtmann and Backes, to Gen. Aniline Wks., N. Y. City.

Petroleum

Sodium plumbite treatment for refining sour hydrocarbon oils. No. 1,940,861. L. M. Henderson to Atlantic Ref. Co., Philadelphia, Pa.

Alcoholic solution of a sulfide of an alkali metal for desulfurizing hydrocarbon oil. No. 1,940,726. J. C. Morrell, to Universal Oil Products, Chicago.

Chemical and physical processes for securing distillates, for purifying, improving and super-refining carbonaceous materials and hydrocarbon oils. Nos. 1,940,648-653. R. P. Russell (3) and H. H. Semmes (3), to Standard-I. G. Co., N. Y. City.

Use of a certain aliphatic amine as a color and gum formation inhibitor in gasolene cracking. No. 1,940,445. W. S. Calcott & I. E. Lee, to duPont & Co., Wilmington, Del.

Nine processes for breaking water-in-oil petroleum emulsions, with variations in demulsifying agents chemicals, and treatment. Nos. 1,940,390-398. Melvin De Groote (9) & L. T. Monson (1) & A. F. Wirtel (6), to Tretolite Co., Webster Groves, Mo.

Coatings

Flaked pigment, drier, and oil modified polyhydric alcohol-polybasic acid resin, as coating composition. No. 1,941,398. J. W. Iliff & P. Robinson, to duPont & Co., Wilmington.

Company Booklets

C92. Aluminum Co. of America, Pittsburgh. A 4-page circular describes activated alumina—a new industrial absorbent of many uses and interesting physical properties.

C93. American Cyanamid Co., 535-5 ave., N. Y. City. "American Hortigraphs and Agronomic Review" (Jan.-Feb. issue) contains the usual amount of "Realnews" about fertilizer problems and the various new uses for cyanamid, "ammo-phos" and "Cyanogas"—a calcium cyanide insecticide.

C94. American Wood-Preservers' Association, Service Bureau, 111 W. Washington st., Chicago. "Wood Preserving News" for January contains several specially interesting articles on creosote and zinc chloride as a wood preserver.

C95. Diamond Alkali Co., Pittsburgh. A new 32-page booklet containing valuable and up-to-date information of particular use to every user of chlorine. It gives an interesting history of liquid chlorine, gives its physical and chemical properties, shows the latest approved methods of handling, application and testing together with a number of useful formulas, tables and graphs gathered through careful research and through the experience of the many industries which this company serves.

C96. The Davidson Commission Co., 327 S. LaSalle st., Chicago. Once more this valuable record makes its appearance giving the 1923-1933 high and low records of fats, oils and by-products by months.

C97. Eagle-Picher Lead Co., Temple Bar Bldg., Cincinnati. December issue of this valuable paint organ features specially fine article on "Selecting Interior Color Schemes."

C98. Foote Mineral Co., 1609 Summer st., Philadelphia. Latest issue of "Foote-Prints" contains an article on zirconium metal. Various chemical fields in which zirconium is now being used are described. The remarkable stability of zirconium at room temperatures and its great chemical activity when heated are paradoxical properties which may prove valuable in a number of other chemical processes. Issue also contains an original article on tungsten carbide by Dr. Colin G. Fink.

C99. Grasselli Chemical Co., Cleveland, Ohio. A 10-page folder describes the improved properties of NuRexform (an improved arsenate of lead) and its uses and proper application as an insecticide.

C100. Grasselli Chemical Co. "Floragard" is the new name for "Manganar Rose Dust." New booklet describes in detail its many uses on roses.

C101. Hercules Powder Co., Wilmington. The clever, entertaining, and instructive *Hercules Mixer* for December contains "Alice in Chemical Land," worth 8 minutes of anyone's time to read. A new method of reporting chemical advances!

C102. Mallinckrodt Chemical Wks., St. Louis. January price list lists a number of important price changes.

C103. Merck & Co., Rahway, N. J. Merck formerly published its quarterly price list in Merck's Report. With the change in policy of that magazine a separate price list of medicinal, analytical, technical and photographic chemicals is now ready.

C104. National Aniline & Chemical Co., 40 Rector st., N. Y. City. December "Dyestuffs" features an article by H. Chadwick—"Delustering Cellulose Acetate Fabrics." Also lists Spring 1934 Colors for Fur Felt Hats; Men and Women's Shoe and Leather Colors for Spring 1934.

C105. Philadelphia Quartz Co., 121 S. 3rd. st., Philadelphia. January "P's & Q's" deals with silicates and pottery.

C106. E. I. du Pont de Nemours & Co., R. & H. Chemicals Dept., Wilmington. New quarterly price list should be in the hands of every user of chemicals.

C107. Rossville Commercial Alcohol Corp., Terre Haute, Ind. Number 108 in the series of "Rossville Alcohol Talks" is all dressed up in a new and atttracive cover and describes most interestingly the aims and methods of antaretic exploration and also tells the use of pure alcohol as a scientific tool in the latest Byrd Expedition

C108. The Sharples Solvents Corp., 23rd and Westmorland sts., Philadelphia. The use of natural gas for industrial and household purposes has grown by leaps and bounds. After exhaustive research Sharples chemists have perfected "Pentalarm" as a warning odor for use in natural gas. A 11-page booklet describes chemical and physical properties of Pentalarm and methods of use.

C109. Industrial Chemical Sales Corp., "Taste and Odor Control" contains up-to-the minute information on the "why and how" of taste and odor control with "Aqua Nuchar." Every worthwhile bit of information and modern practice in the application of powdered carbon to water is taken up in detail. In the appendix appears specific "Suggestions for Taste and Odor Control;" procedures for making routine taste and odor determinations; a helpful method of coagulation control and other worthwhile technical data.

C110. Solvay Sales Corp., 40 Rector st., N. Y. City. "The Advantage of Special Cleansers For Dairy Use" is a new booklet on cleansers prepared to answer questions on choice of cleansers, testing alkali cleansing problems, etc.

Chemical Industries,
25 Spruce Street, New York City.

I would like to receive the following booklets; specify by number. .....

.....

Name.....

Title.....

Company.....

Address.....

C. Feb.

Chemical Production

A digest of plant management, design, equipment and containers for the makers of chemicals.

Successful Management Policies

By William Hulme Lever*

My father's policy and practice in the further development of his business may be said to have followed three main lines.

1. *Financial Policy*—My father's practice was to keep the ordinary capital of the company in his own hands and to go to the public with issues of preference shares and preferred ordinary shares. In this way he enjoyed greater freedom in embarking on new enterprises than would have been the case had the ordinary shares been in the hands of the public. It also enabled him, at a later date, to institute a "Co-Partnership Scheme" under the terms of which the profits available for the ordinary shareholders were divided between them and employees and members of the staff to whom were allotted Co-Partnership certificates in proportion to their length of service and status in the business.

2. *New Products*—My father followed his original article with a sequence of new ones. After Sunlight Soap came "Lifebuoy;" after Lifebuoy, "Lux." He then entered the toilet-soap field and so it went on, each of the new products being developed out of the profits of its predecessors, and no step being taken until the previous one had been consolidated.

3. *Associated Companies*—As the business in England grew, my father turned his attention to the export trade, and when the time was ripe he began establishing in his main overseas markets associated companies with factories of their own. In this way works were opened in the "nineties" in Switzerland, Australia, Canada, and at Cambridge, in Massachusetts; and so the policy was continued and is still being followed, our latest overseas factory being at Bangkok, in Siam, and one is now in process of erection at Bombay, in India.

Home and Foreign Markets

Side by side with this policy there was an analogous development in the home market; but the territories to be won were not overseas markets but other branches of the British soap-making industry. My father found that the most effective way of entering other sections of the trade was to buy existing, well-established businesses. These mergers were eventually followed by others, and ultimately the majority of the leading British soap manufacturing concerns became "associated companies."

It is impossible here to refer in detail to the management practices which enable this large family of companies to function efficiently. There is one feature, however, which does call for special notice, because we find it was put into force by the founder of our business when he was managing the Wigan branch of his father's wholesale grocery house. I refer to his practice of making up "pro forma" statements every three months of the sales and profits to be aimed at for the following three months, and every year for the following year. This policy he carried over into Lever Brothers and it has been followed ever since. Today every associated company in every part of the world sends to headquarters—Unilever House, Blackfriars, London—its estimate of costs, production, sales, advertising and other relevant factors for the ensuing year. On these is based a "datum" of profits for each company to aim at. It is a vastly more complicated practice than it was in the days of a few ledgers and account books in the warehouse of Lever and Company at Wigan; but the policy is the same.

Ability To Organize and Properly Direct

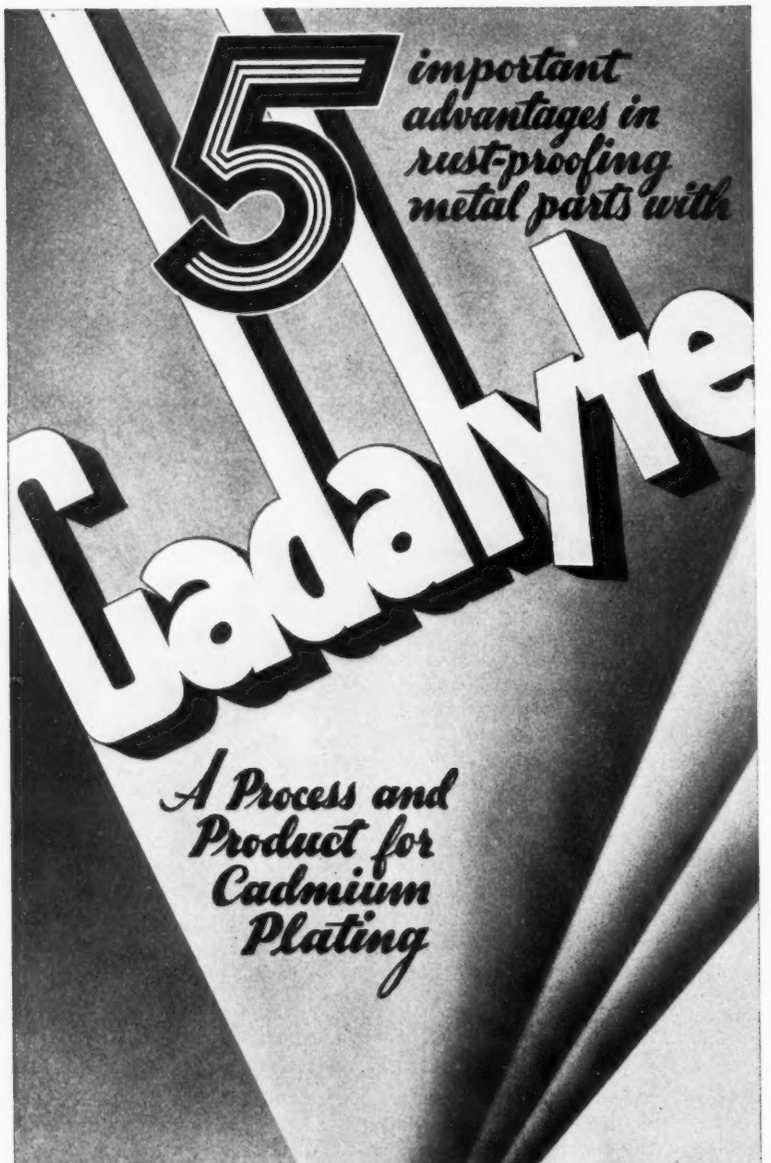
Asked on one occasion to what he attributed his success, my father replied: "I organize, depute and criticize," and there is no doubt that his achievements were in a large measure due to his powers of organization and to his ability in choosing men. At the same time he knew that, in business, criticism to be useful must be constructive and not destructive.

In reply to an interviewer who asked his opinion on the choosing of personnel, he said:

> The first qualities I look for in an employee are loyalty, integrity and industry. If with these qualities are coupled ability, ambition, alertness and quickness of perception, he is additionally attractive. When vacancies occur, requiring appointments from outside the staff, I find the filling of such vacancies full of uncertainty and surrounded with difficulties. To obtain suitable men, the best course, in my opinion, is to develop and train them on one's own staff. I think it is essential to all businesses that men on the staff should feel that they have first choice; but here the great difficulty comes in. As the business gets larger, the heads of the firm come less and less into personal contact with the staff. This is the obstacle to personal selection from one's own staff, but it is not insuperable.

It is obvious that in any large industrial organization the finding of the right man for the right place must be one of the most important considerations; especially is this so where long distances make personal contact rare. While it is wise, from time to time, to bring new blood into a concern, I feel convinced of my father's wisdom in relying mainly upon the men who had been trained and brought up in the business itself.—Lord Leverhulme, Lever Brothers, Ltd., *Executive Service Bulletin*, Metropolitan Life Insurance Co.

*2nd Viscount Leverhulme, Governor, Lever Brothers, Ltd.



THE CADALYTE Process of cadmium plating provides a maximum degree of rust-protection with a minimum thickness of deposit. It affords complete mechanical and electro-chemical protection of iron and steel products by an electro-deposit of 100% pure metal. It assures a rust-proof coating which embodies the desirable characteristics of brilliancy, density, ductility and absolute adherence.

CADALYTE'S Economy—the stability of the CADALYTE solution, its high throwing power, low resistance, high and equal cathode and anode current efficiencies, its ability to accommodate high current densities, and its simplicity of maintenance, all contribute to effect economies which make the CADALYTE Process the most economical you can use.

Grasselli Technical Service—Grasselli experts in metal protection are available at any Grasselli branch. They will gladly consult with you on your plating problems.

Send for Booklet

Send For Cadalyte Booklet—An authoritative booklet on Cadmium Plating is yours for the asking. It is full of valuable information.

THE GRASSELLI CHEMICAL CO.
INCORPORATED
FOUNDED 1839 CLEVELAND, OHIO

New York and Export Office: 350 Fifth Avenue

Albany	Charlotte	Detroit	New Orleans
Birmingham	Chicago	Milwaukee	Philadelphia
Boston	Cincinnati	New Haven	Pittsburgh
	St. Louis	St. Paul	

SAN FRANCISCO, 584 Mission St. LOS ANGELES, 2260 E. 15th St.
Represented in Canada by CANADIAN INDUSTRIES, LTD.
Acids and General Chemicals Division—Montreal and Toronto

Plant Management

Proper Chemical Accounting

As a result of increased use of mechanical methods, overhead costs now represent a much larger, and important, proportion of the total cost of production than hitherto. This is more than ever apparent in chemical manufacture. Problem of controlling and distributing overhead costs is one which must be given very careful attention, if the desired accuracy is to be obtained in the resultant costing statistics.

Until recently "overheads" were generally looked upon as being that part of the cost of production which was, more or less, uncontrollable, with the result that attempts to control production expenditure were usually confined to labor and material representing direct or prime cost. In chemical manufacture it is of the utmost importance that the incidence of overhead charges throughout the various processes should be correctly determined, otherwise costing results cannot be viewed in their true perspective. Most common method in use for distributing "overheads" to production costs is by the application of a uniform percentage rate in relation to the amount of direct labor. Use of this method assumes that, for the most part, "overheads" are incurred in relation to the direct labor employed on production. When one appreciates, however, the varying classes of expenditure covered by the term "overheads", it will readily be seen that a uniform rate of distribution is certainly not logical or justifiable.

"Service Costing" Explained

Present-day requirements, so far as the control of overhead costs is concerned, are fully met by the use of what is termed "service" costing. If an attempt is to be made to control this expenditure, it is necessary to analyze or classify the various "functions" comprising overheads. This classification forms itself into 3 distinct groups (a) factory, (b) selling and distribution, and (c) administration. These are applied to production costs in the order given above. Procedure is firstly to determine direct or prime cost of production representing labor and material, to which is added factory expenses or "overheads," the result at this point being the total cost of production; thereafter selling and distribution expenses should be added, and finally the relative proportion of administrative expenses. Examples of some of the principal "service costs" are:

Factory. Lighting, heating, internal works transport, laboratories, storekeeping, inspection, canteen, timekeeping, production and planning, warehousing, supervision, power, water, fire and other insurances, maintenance, etc. Selling and Distribution: Advertising, salesmen's commission, salaries, carriage outwards, branch sales office expenses. Administration: General office expenses, clerical and other administrative salaries, stationery, telephone, etc.

Next step is to collect and distribute all relative expenses to each particular department so that total cost of maintaining each service may be known, object being, to exercise control over cost of these services, and to apply the most logical method of distribution in each particular case.

Frequently, wages that are not chargeable direct to production are termed "indirect" and included as such in one total in overhead expenses. Term "indirect," is not specific enough to indicate what it relates to. Under service costing methods, all such indirect wages relating to supervision, warehousing, storekeeping, timekeeping, canteen, etc., would be analyzed and charged to each particular service department. Same principle should be adopted in regard to other expenses which are chargeable to various service departments. This means "overheads" are charged to manufacturing processes, and, where applicable, to service departments as well, thereafter when the total of each service cost has been determined it requires to be redistributed to the various manufacturing processes. At first this may appear to be an unnecessary refinement of costing practice, but one must bear in mind the fact that in many businesses "overheads" account for at least 30-40 per cent. of the total.

Definite Rules For Distributing Costs

Following particulars are given to illustrate what should be done in regard to the collection and distribution of overhead or service costs.

Depreciation. Distribution of this charge is on an actual basis and involves no element of approximation. In each case various departments are charged with their legitimate proportion relating to plant, equipment, and buildings. Where one main building houses, say, 3 or 4 different departments, then depreciation should be split up on the basis of floor area.

Repairs and Maintenance. This expense is also charged to the various departments on an actual basis, as records will be kept from time to time, in the required classification, to permit of this distribution being made. The idea is to eliminate the use of an omnibus account for "general repairs" otherwise it would be impossible to exercise any measure of control over this expenditure.

Rates and Taxes. This charge is levied on the basis of the annual rental value of the assets, and the most logical method of distribution, therefore, is on a floor area basis.

Employers' Liability Insurance. This premium is paid on the basis of the wages and salaries charged, varying rates being applicable to different classes of employees. The distribution is, therefore, applied on a percentage basis in relation to the actual wages and salaries departmentally.

Fire and Other General Insurances. Reference to the schedules attached to the policies will, in each case, provide the basis on which a logical distribution can be made. For fire insurance particular attention should be paid to special risks which may be incurred in certain departments, and also in relation to the storage of inflammable material.

Lighting. It would be impracticable to meter electricity which is used for lighting in each department, nevertheless a satisfactory allocation may be obtained on the basis of the number and wattage of lamps in use.

Heating. Generally the heating of an establishment is supplied by steam from the boiler plant which is also used in chemical factories for process work and motive power. A separate cost would, therefore, be obtained per 1,000 gals. of water evaporated, and in addition to distribution of steam for process and other purposes, a charge would also be determined for heating and finally distributed on an area basis.

Supervision. This represents the wages and salaries of works manager, production engineer, foremen, etc., and the most suitable method for recovering this expense is on the basis of wages paid departmentally.

Production and Planning. This expenditure is mainly influenced by the volume of production, or operating time, either of which should represent the basis of distribution.

Laboratories. Where products are subjected to laboratory tests during the various stages of manufacture, undoubtedly this expense should rightfully be charged to production costs. There is a difficulty, however, in determining a satisfactory unitary basis for distributing this expense. Volume of output, or operating time, departmentally are factors which largely govern incidence of this expense, and either basis may be used to accomplish a satisfactory distribution.

Timekeeping. The cost of timekeeping, although not usually a heavy one, is largely influenced by the number of employees, and this should represent the basis of allocation.

When total factory cost, or cost of production, has been determined, which will include the whole of the factory overheads, there remains to be allocated proportion of selling and distribution expenses, and finally, cost of administration. Selling and distribution expenses should be recovered as a percentage of the total factory cost rather than on the basis of sales value. If the latter method is adopted, the tendency will be to burden products which are earning more profit than others with relatively more

IN YOUR BUNDLE FROM THE LAUNDRY

DISCOVER ANOTHER USE OF P. Q. SILICATE OF SODA

SNOWY WHITE SHIRTS, sheets, towels, overalls, any wearing apparel or fabric that needs laundering are washed to look like new with P. Q. Silicate of Soda. It keeps colors bright and prevents greyness which dulls white clothes.

P. Q. Silicate of Soda has been known for three-fourths of a century for its detergent values. The fundamental advantage of quick emulsifying of oils and greases without damage to delicate surfaces, serves in dozens of washing operations.

The dairy for the cleaning of expensive equipment, the electroplater for cleaning metals, the textile mill for boiling off and scouring, all appreciate the thoroughness and safety of silicates of soda.

You, too, have a cleaning or washing operation (if only maintenance cleaning) which P. Q. Detergents can improve, either in results or in cost. Clip the coupon for a sample of the cleaner for your needs.

General Offices and Laboratory: 125 S. Third St., Philadelphia, Penna. Chicago Sales Office: 205 W. Wacker Drive. Stocks in 65 cities. Sold in Canada by NATIONAL SILICATES LTD., Toronto, Ontario.

Works: Anderson, Ind., Baltimore, Md., Chester, Pa., Gardenville, N. Y., Kansas City, Kans., Rahway, N. J., St. Louis, Mo., Utica, Ill.

SEND information on P. Q. Silicate of Soda for cleaning . . .

Fill in

TO_____

_____

_____

3

PHILADELPHIA QUARTZ COMPANY

EST. 1831

selling expenses, whereas this is a factor which has no bearing on the incidence of this expense. Cost of general administration is finally applied as a percentage to the total factory cost plus selling expenses, the net result of which represents the final total cost.

An important point which requires consideration in connection with the distribution of "overheads" is the fact that, unless the output of all producing departments remains steady throughout the various accounting periods in, say, a year, the incidence of "overheads" to total cost will tend to vary one period with another, thus making it impossible to obtain comparable costs. In these circumstances, therefore, what requires to be done is to predetermine, at the commencement of the year, the total overhead expenses relating to each department, and a unit recovery rate determined on the basis of the expected volume of output. This will equalize the recovery of overhead expenses throughout the year, and obviate showing what in reality only represents fluctuations which usually occur due to seasonal trade.

A factor which has a very large bearing on overhead costs is "unused plant capacity." Where idle capacity exists it is of the greatest importance to see that the costs differentiate between overheads chargeable to production as distinct from idle capacity. Treatment of overheads in the manner outlined will provide valuable data for the purpose of making the necessary distinction in this respect.—*The Chemical Age*, British, Dec. 9, '33, p. 527, "How to Control Overhead Costs," by L. A. Wight.

Heavy Chemicals

Novel Nitric Acid Production Process

Trials are being carried out in Scandinavia, reports the *Chemical Trade Journal*, London, on a process (the Nodon process) for the production of nitric acid from peat bogs by electrolysis. Process is carried out by burying in the soil a number of porous vessels, each about 2.5 meters high and 0.4 meters in diameter. These vessels are sunk at about 1 meter apart, and are connected by iron bars which serve as cathode. The anode is formed by coke placed in the bottom of each vessel, the coke being covered at the outset with dilute nitric acid. Round each vase an annular space is made and filled with calcium carbonate, which is soon converted to nitrate. Once the circuit is closed, the peat itself forms the true electrolyte. The current which is passed decomposes the nitrate of lime, and the nitric acid penetrates into the porous vessels. In each vessel there are two metallic tubes; one, which reaches to the bottom, is for the removal by pumping of the weak nitric acid; and the other, which just enters the vessel, is for the renewal of the water. The acid drawn off is about 3° Be. on the average, and is concentrated by the usual methods. Both the amperage and voltage of the current used should be kept low if good yields are to be obtained. The calcium carbonate outside the vases must be renewed from time to time, for without this precaution the soil would become too acid and the nitric ferments cease to act.

German Advances in Vanadium Catalysts

A modified type of vanadium catalyst for sulfuric acid manufacture is described in German patents granted to Slama and Wolf. According to these patents, average diameter of particles of kieselguhr or other material used as carrier, should not be more than 60 microns, and preferably below 20 microns. Addition of soda or potash compounds which lengthen the life of the catalyst is recommended. To minimize the hygroscopic properties of the catalyst, the mass is heated in air and in the absence of sulfur dioxide. Ammonium vanadate or potassium vanadate is the source of the vanadium. In the preparation of the catalyst, the finely ground carrier is mixed with the vanadium compound and heated to the necessary temperature. — *Chemiker-Zeitung.*

Patents—Industrial Chemicals

Mfr. of vegetable condensation products, reaction process, treatment and production; with No. 1,941,351 on the making of a pectose resin. Nos. 1,941,349-50-1-2. A. Hawerlander, to Estate A. D. Stewart, St. Joseph, Mo.

Titanium sulfate compounds, dissolving easily and useful for weighting and tanning agents. No. 1,941,285. L. Teichmann & H. Noerr, Leverkusen, to I. G. F., Frankfort, Ger.

Plastic composition, cellulose acetate and a chlorinated diphenyl. No. 1,941,262. R. L. Jenkins, to Swann Research, Inc., Birmingham, Ala.

For making calcium sulfate hemihydrate from calcium sulfate anhydrite, in plaster of paris mfr. No. 1,941,188. W. S. Randel, to U. S. Gypsum Co., Chicago.

Vinyl ethers. No. 1,941,108. W. Reppe, to I. G. F. Frankfort, Ger.

Production of sterols, saponifying, cooking and separating. No. 1,941,097. R. F. Light & C. N. Frey, to Standard Brands, N. Y. City.

Process for the synthesis of organic acids. Nos. 1,940,987-8. A. T. Larson, to duPont & Co., Wilmington.

The preparation of organic acids. No. 1,940,989. A. T. Larson, to duPont & Co., Wilmington.

Improvement in circulating gases for synthetic production of ammonia. No. 1,940,860. A. E. Hecker to Mathieson Alk. Wks., N. Y. City.

Method in reduction of amount nitric acid in crystallization of aluminum nitrate from treatment of leucits. No. 1,940,842. A. C. Blanc, Rome, Italy.

For recrystallizing and purifying tetryl. No. 1,940,811. W. H. Rinkenbach & E. D. Regad, Dover, N. J.

Stable bituminous solutions from impure green petroleum sulfonic acids. No. 1,940,807. Leo Liberthson, to L. Sonneborn Sons, Inc., N. Y. City.

Impregnating fur skins with colorless soluble cyclic oxidizing catalyst, for bleaching. No. 1,940,768. W. E. Popkin, Brooklyn.

Synthetic resin from reaction allyl alcohol with cresol, zinc chloride as catalyst. No. 1,940,727. W. H. Moss & G. W. Seymour, to Celanese Corp.

Caustic alkali wood solution without dissolving all lignin, for use in storage battery plates. No. 1,940,714. E. A. Giard, to Vesta Consolidated Inc., Del.

Ca or Mg silicate as part of gelatinous adherent coating to insulate electrical apparatus. No. 1,940,707. V. B. Browne, Breckenridge, Pa.

Mfr. of phosphoric acid by H_2SO_4—step of increasing size of calcium sulfate crystals. No. 1,940,689. G. T. Moore, to Phosphoric Products Corp., N. Y. City.

Ethylene dichloride-carbon tetrachloride cleaning fluid. No. 1,940,688. A. Mohn, to Rhodes-Perry-Martin, St. Louis.

Caustic soda process for solution of sodium resinate from rosin. No. 19,036 (Reissue from '26) A. Thiriet and P. Delcroix, to Procedes Navarre, Lyons, France.

Process for dehydrating magnesium and similar chlorides. No. 1,940,620. J. Blumenfeld, to Ste des Produits, Chimiques des Terres Rares, Paris.

Purifying magnesium by use of chlorides of calcium and sodium. No. 1,940,618. E. O. Barstow & J. A. Gann, to Dow Chem. Co., Midland, Mich.

Method of separating alkali metal acetates. No. 1,940,611. Striscaker, Kennedy and Pelton, to The Dow Chem. Co., Midland, Mich.

Zirconium salts in tanning. No. 1,940,610. I. C. Somerville, to Rohm & Haas Co., Inc., Philadelphia, Pa.

Chlorine-calcium carbonate-ammonia method for making chloramine. No. 1,940,592. C. T. Henderson, Burlingame, Calif.

Soluble cellulose esters of higher fatty acids. No. 1,940,589. M. Hagedorn & G. Hingst, to I. G. F. Frankfort, Ger.

Process for making shaped and easily soluble mixtures of soaps and persalts. No. 1,940,570. Adolf Welter, Krefeld, Ger.

Non-saponaceous cleaning composition, of toluol, butanol, butyl acetate ethyl acetate and lanolin. No. 1,940,558. C. G. Moore, to Glidden Co. Cleveland, Ohio.

For elimination of calcium chloride from mix of calcium hypochlorite and chloride. No. 1,940,557. J. A. M. W. Mitchell and F. T. Meehan, to Imperial Chemical Industries Ltd., England.

A product, Montan wax and paraffin wax, dispersed in an aqueous medium containing rosin soap. No. 1,940,432. O. F. Neitzke, to Bennett, Inc., East Cambridge, Mass.

Alkaline aqueous dispersion of Montan wax and its saponifiable content. No. 1,940,431. O. F. Neitzke, to Bennett, Inc., East Cambridge, Mass.

Treatment of liquids by barium ferrite. No. 1,940,409. Gail J. Fink, to Nat'l Aluminate Corp., Chicago.

Use of anhydrous gaseous oxidizing agents for working up products from hydrocarbons. No. 1,940,400. Wm. Dietrich, to I. G. F., Frankfurt, Ger.

Resinous compound from phosphorous chloride, ammonia and an aldehyde. No. 1,940,383. W. H. Woodstock, to Victor Chem. Wks., Chicago.

Non-gelationous dynamite composition. No. 1,940,255. N. G. Johnson, to du Pont & Co., Wilmington, Del.

Sulfo-nitrocellulose acetate. No. 1,940,218. H. Kranich, West Hampstead, N. Y.

High carbon hydrocarbons from low carbon-content hydrocarbons. No. 1,940,209. F. Fischer & H. Pichler, Mulheim, Ger.

Condensation products from hydroxy-carboxylic acid and resinic acid. No. 1,940,092. H. Krzikalla & W. Wolff, to I. G. F., Frankfurt, Ger.

Aqueous sulfuric acid and acid-concentrated olefine process, of sulfating olefines. No. 1,940,073. Benj. T. Brooks, Stamford, to Stand. Alcohol Co., Wilmington, Del.

Iron and lead corrosion preventor, sodium tetra borate, salicylate and nitrite. No. 1,940,041. Braxton D. Avis, Washington, D. C.

Addition of a neutral salt of a monobasic organic acid, for treating cheese. No. 1,940,031. J. Taub, Jackson Hts., N. Y.

Hydrocarbon oil with trace of a halogenated organic acid-diphenylene oxide product, as lubricant. No. 1,939,979. A. Henriksen & B. H. Lincoln, to Cont'l Oil Co., Okla.

Gelatinized corn starch product. No. 1,939,973. F. O. Giesecke, Evanston, Ill., to Int'l Patents Development Co., Wilmington, Del.

Silicate of soda and pigmenting substance method for coloring granular mineral material. No. 1,939,930. H. L. Small, to Philip Carey Mfg. Co., Ohio.

Polymerization of oil from the nut, sterculia foetida, to produce a composition. No. 1,939,773. M. T. Harvey, to Harvel Corp., N. J.

Gelatine emulsion film under acid solution to prepare hardened film blanks. No. 1,939,738. Bertha S. Tuttle, Boston, to Technicolor, Inc., N. Y.

Cellulosic material fermentation, to produce acetic acid and glucose. No. 1,939,736. P. A. Tetrault, to Wisconsin Alumni Research Assn., Madison, Wis.

Improved catalyst for methanol and other carbon compounds. No. 1,939,708. Application June, '27. A. T. Larson, to duPont & Co., Wilmington.

Infusible synthetic resins—reaction of aniline, strong mineral acid and formaldehyde. No. 1,939,691. P. Haller and H. Kappeler, Switzerland, to Ciba Products Corp., Dover, Del.

Diaryl guanidine salt as gum inhibitor for hydrocarbons. No. 1,939,659. W. S. Calcott, & H. W. Walker to duPont & Co., Wilmington, Del.

Method of impregnating porous, rigid silica gel material with a catalyst. No. 1,939,647. H. R. Arnold & W. A. Lazier, to duPont & Co., Wilmington, Del.

Fine Chemicals

Russian Sodium Hydrosulfite-Formaldehyde

A Russian process for the manufacture of sodium hydrosulfite-formaldehyde (this process was the subject of a sealed communication entrusted to the Societe Industrielle Mulhouse in 1904 and just recently made public) is described by the producer Emil Zundel, Moscow, in the *Bulletin of the Society of Industrielle Mulhouse*, '33, p. 463.

To a mixture of 160 kilograms of sodium bisulfite containing 26% of total SO_2 and 160 kilograms of ice, contained in a wooden vat, there is added with energetic agitation a mixture of 27 kilograms of zinc dust and 13 liters of water; and also, simultaneously, through a tube going to the bottom of the vat a mixture of 44 kilograms of 52° Be. sulfuric and 40 kilograms of ice. Operation should not take longer than 5 to 6 minutes. There is then added 46-48 kilograms of sieved soda ash. Solution is agitated until the soda ash is dissolved, and if the presence of soluble zinc is ascertained, this is removed by the addition of further small quantities of alkali, but an excess of soda ash in the solution should be avoided. The neutral liquid obtained is filter-pressed, and should yield about 350 liters of a solution of sodium hydrosulfite, of which 5 to 6 cc. should reduce, on the average, 20 cc. of ammoniacal copper solution containing 25 grams of copper per liter.

To the filtered solution is added 84 kilograms of salt (which should be free from lime and magnesia compounds), and the solution agitated for from 30 to 35 minutes until the salt is completely dissolved. The sodium hydrosulfite is precipitated in small sandy crystals. These settle rapidly, and after an hour's settling the saline liquid is siphoned off and the hydrosulfite filtered through 2 to 3 filter frames. When a frame is filled, its contents are further pressed in a hand press, the operations being done as quickly as possible to avoid oxidation. The cakes are then immediately introduced into 25 kilograms of 40% formaldehyde. On the average, from the quantities given, 52 kilograms of pressed product are obtained, and it is always advisable to verify its strength. Fifty grams are added to 200 cc. of water, and if the product is satisfactory 4.6 to 5 cc. of the solution obtained should decolorize 20 cc. of the ammoniacal copper solution. Where the whole of the pressed hydrosulfite has been added to the formaldehyde, the excess of the former is reacted with a further quantity of the aldehyde. For 100 parts of pressed hydrosulfite, 54 parts of 40% formaldehyde are usually required—*i.e.*, 28 kilograms of formaldehyde to 52 kilograms of hydrosulfite. The 3 extra kilograms of formaldehyde thus required is added to the mixture, with good agitation in quantities of not more than half a kilogram at a time. The exact end point can be determined easily with the aid of litmus. So long as there is an excess of hydrosulfite the litmus is decolorized, but as soon as there is the slightest excess of formaldehyde the litmus reacts alkaline. The hydrosulfite-formaldehyde solution is obtained as a thick liquor, and very slightly turbid.

Patents—Fine Chemicals

Tobacco impregnated with 3.6 diamino 10 methylacridiniumchloride. No. 1,941,416. W. Petterson, Berlin, Ger.

Salts useful in therapeutics, N-substituted derivatives of the pyridone series. No. 1,941,312. K. Miescher & E. Urech, to S'te of Chem. Ind., in Basle, Basel, Switz.

In the making of ether derivatives from carbohydrates like cellulose. Nos. 1,941,276-7-8. A. W. Schorger, to C. F. Burgess Labs., Madison, Wis.

Organic arsenic compound. No. 1,940,760. E. Lyons & O. M. Gruhzit, to Parke Davis & Co., Detroit.

Two processes for producing phenolphthalein. Nos. 1,940,494-5. M. H. Hubacher, to Kavalco Products, Inc., Nitro, W. Va.

Recovery of relatively pure d-glutamic acid from crude material thereof. No. 1,940,428. Reisuke Masuda, to The Larrowe-Suzuki Co., Rossford, Ohio.

Use of pancreas proteinases for drenching skins. No. 1,940,265. W. Neugenbauer, to Kalle & Co., Wiesbaden, Ger.

Dilute acid-organic solvent means of purifying tubercle waxes. No. 1,940,174. C. L. Lautenschlager, Frankfort, to Winthrop Chem. Co., N. Y. City.

Purification of phenolphthalein having resinous impurities. No. 1,940,146. H. P. Roberts, to Kavalco Products, Inc., Nitro, W. Va.

Coal Tar Chemicals

Gasoline-Benzol Blending

Some of the British gas companies manufacturing motor benzol from the gas, using vertical retorts for carbonization, and gas-oil as washing medium, find it advantageous to purchase crude benzol from other smaller concerns, having no rectification plant, and to refine and distill these crude benzols for admixture with the locally-produced spirit, since benzol obtained where vertical retorts and gas-oil are used is low in aromatic hydrocarbons, high in paraffin and naphthene hydrocarbons, and of low specific gravity.

By suitable blending with the refined benzols from other sources, possibly obtained where horizontal retorts are used in the carbonization of the coal, and for an aromatic oil such as creosote has been employed to wash the gas, an improved mixed product is obtained, containing a greater proportion of aromatics, and a higher specific gravity, thus enabling it more closely to suit the requirements for motor benzol, as laid down by the National Benzol Company, to whom it is sold. It is not a dfficult matter for concerns using the "active carbon" method to adjust the nature of the product to the desired standard, owing to the progressive selective adsorption properties of the active carbon. Other specifications, as for example, those for total sulfur, sulfur as carbon disulfide, tendency to gum, etc. have however to be met, as well as for those for specific gravity, color boiling range, etc.

Patents—Coal Tar Chemicals

Fast, green, anthraquinone dyestuffs. No. 1,941,063. Weinand, Taube and Hertlein, to Gen. Aniline Wks., N. Y. City.

Colored, light-fast spirit varnishes. No. 1,941,058. H. Schladebach & H. Hahle, Dessau, to Gen. Aniline Wks., N. Y. City.

Azodyestuffs and fiber used. No. 1,941,057. Runne, Moldaenke & Kirst, Frankfort, to Gen. Aniline Wks., N. Y. City.

Insoluble azodyestuffs. No. 1,941,035. L. Laska & B. Heyn, Offenbach, to Gen. Aniline Wks., N. Y. City.

H superoxide with a diamone, in dyeing hairs, furs and feathers. No. 1,940,757. E. Lehmann and H. Wasseneger, to Gen. Aniline Wks., N. Y. City.

Disazo dye. No. 1,940,683. H. Jordan, to duPont & Co., Wilmington, Del.

For preparation of organic acids. No. 1,940,674. G. B. Carpenter, to duPont & Co., Wilmington, Del.

Water soluble azodyestuffs. No. 1,940,662. H. Clingestein & K. Dobmaier, Germany, to Gen. Aniline Wks., N. Y. City.

Vat dyestuff—isopropyl ether of a hydroxy-dibenzanthrone compound. No. 1,940,419. E. T. Howell & O. Stallmann, to duPont & Co., Wilmington, Del.

Fast azodyestuffs insoluble in water. No. 1,940,068. Zerweck, Schutz, Carl and Rosenbach, to Gen. Aniline Wks., N. Y. City.

Copper containing azodyestuff. No. 1,940,066. R. Stusser, Cologne, to Gen. Aniline Wks, N. Y. City.

For the separation and purification of isometriczylenes from crude zylene. No. 1,940,065. H. C. Spannagel & E. Tschunkur, to I. G. F., Frankfort, Ger.

Water-insoluble azodyestuff, various shades. No. 1,940,059. F. Muth, Germany, to Gen. Aniline Wks, N. Y. City.

Agricultural Chemicals

New Complete Fertilizer

A new type of fertilizer is proposed which is prepared by heating to fusion a mixture of silica, phosphate rock, and soda ash. Product is cooled, lixiviated with hydrochloric acid, partially dried, and finally mixed with a product containing potash and nitrogenous bodies.

Patents—Agricultural Chemicals

Method of manufacturing calcium cyanamid. No. 1,941,172. Katsuharu Hibi, Tokyo, Japan.

Naphthalene-nicotine insecticide. No. 1,941,055. H. L. Renard, Basking Ridge, N. J.

Pyrethrum spraying of non-alkaline material for production of horticultural dust. No. 1,940,899. A. E. Badertscher, to McCormick & Co., Baltimore, Md.

Organic dithiophosphate disinfectant for seeds. No. 1,939,951. G. H. Buchanan and Wm. Moore, to American Cyanamid Co., N. Y. City.

Method for predetermined quantity and quality of fertilizer from potassium phosphate conversion. No. 1,939,858. C. B. Locklin, Los Angeles, Calif.

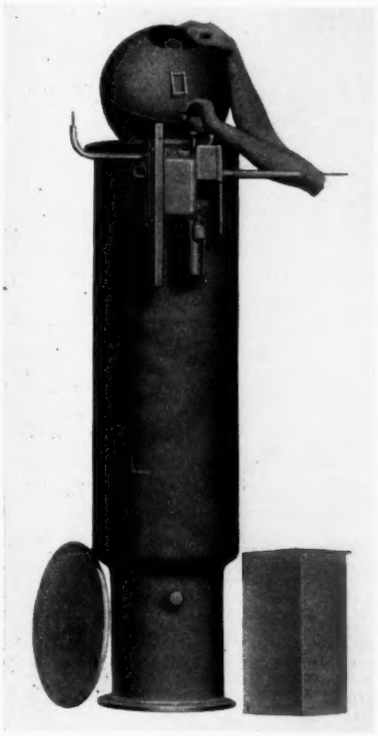
Plant Operation

Considerable interest is centered around the accidental deaths of several men working in the experimental division of British Celanese, located near Derby, England. Because of the secrecy surrounding the process, the coronor's inquest was held privately, but it is reported that the men were subjected at times to the fumes of a derivative of ethylene-glycol. In the absence of more definite knowledge as to the exact cause, British Celanese has shut down the division working on this particular product until such time as final tests are made and suitable precautions taken.

New Equipment

Fire Protection in Plant and Laboratory

A new fire protection system for protecting dip tanks, drain boards, quenching tanks, mixing churns, cleaning tanks, and a wide variety of vessels containing flammable liquids has just been developed by the American-LaFrance and Foamite Corp. Elmira, N. Y. New system is known as the FOAMITE System Type ST. Instead of being composed of standard devices taken from the portable line, new FOAMITE system Type ST is designed and built for stationary installation only. One of the important features of the new system is the reduction of about 50% of the floor space required. This not only permits the placing of the unit closer to the risk but results in floor area economy in departments where space is at a premuim. In contrast to the previous tip-down models requiring sufficient operating clearance at all times, the moving parts of the new type are actually enclosed—there are no vital parts exposed to tampering that might cause accidental discharge. All units of the new system have full openings at the top and ample drains at the bottom. This makes recharging easy and thus reduces maintenance costs. Actual inspection of the interior can also be made at any time.



Steel Panels For Circuit Breakers

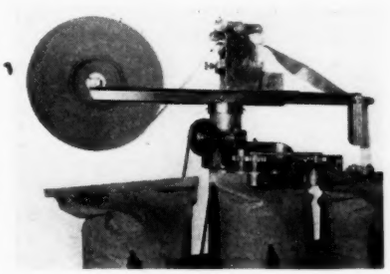
Self-supporting steel panels for mounting small oil circuit breakers for isolated installations have been announced by G. E. Equipment is suitable for use on ungrounded systems up to 2,500 volts. Oil circuit breaker interrupting ratings are 20,000 to 50,000 kva. The great advantage of this equipment lies in the fact that it can be connected up and put into operation immediately upon its receipt inasmuch as it requires no assembly of apparatus or adjustment of the breaker or mechanisms. All this work is done at the factory and the equipment is shipped in full working order. New equipment consists of an isolated flanged steel panel, to which supporting feet have been welded, so that the panel when fastened to the floor becomes a self-supporting structure. In addition to the breaker and its operating lever, accessory apparatus such as current transformers, relays, etc., can be mounted on the panel. If desired, a metal guard can be obtained to enclose the back of the equipment from the top of the breaker tank to the top of the panel.

New Heat Unit

To retard chemical action on lead-sheathed units used for heating corrosive solutions, such as pickling and plating baths, G. E. has developed a new heating unit which contains a sheath-wire winding about which is cast a heavy block of lead. New unit has a low watt density of 13 watts per square inch of immersed surface, a factor which should greatly increase the life of the device. Company has also announced a new copper-sheathed unit to meet the need for a heating device which can be carried about, placed in almost any vessel containing water, and plugged into an ordinary power circuit to heat the water. It is formed in a self-supporting helix with long vertical extensions ending in a sealed-plug socket. Only the spiral is active; thus a vessel need not contain more than approximately 5 inches of water to permit use of the unit. This device has a rating of 1300 watts at 115 or 230 volts. Another G. E. heating unit recently designed is made entirely of monel metal which does not stain linseed oil when heating the oil in the manufacture of ink, varnish, etc. Although electric heat is particularly valuable for such applications because of the need for accurate temperature control etc.

Innovation in Bag Closures

Bemis Bro. Bag, St. Louis, reports a new development in bag closures for paper-lined cloth bags. New closure is designed to give chemical manufacturers a better container. An important reduction in shipping weight and better protection are the outstanding advantages claimed for bags sealed by the new Bemis method. An official of Bemis Bro. Bag Co. described the development of this new closure as follows: Paper-lined cloth bags have always offered decided saving in weight and material cost for shipping. In addition they are easier to store and handle both empty and when filled. The only possible objection to their use has been the sewing or wire tying of the ends. This old closure method sometimes resulted in weakness at the ends and if wire tied, the operation was wasteful of bag material. New closure consists briefly of a cemented strip which is applied by machine over the open end of the bag. The cement used is absolutely water-proof. It gives the same complete water-proof, sift-proof closure at the top as that applied to cemented seam bags at the bottom in the bag plant. Consequently the bag is 100% strong, sift-proof and water-proof throughout. The cement sets instantly. As soon as the bags are closed they can be thrown on a conveyor and loaded in a car or put in storage without the loss of time. There are no weak spots—no possibility of damage through sifting or from water.



This closure method also provides a more symmetrical package, easier to stack in the warehouse. It makes for easier opening; a knife slit down the center of either the top or bottom tape closure provides a small opening for pouring or a full mouth opening as desired. The handy ears which this closure forms on the bag are an extra advantage which requires no added material but are merely a fortunate result of the new closure method which works as follows:

Bags come from the filling and weighing machine on to a conveyor which brings them to the sealing machine. Here the top of the bag slides through guides which hold the bag material erect so that the top material is pressed closely together in a straight line. At the same time the sealing tape, coated with

cement and crimped into an inverted V shape, folds itself over the full length of the bag top. As the bag moves on, its top with the tape in place passes between rollers which apply heavy pressure, forcing the cement in to secure a perfect bond between bag material and tape. As finally sealed, the bag mouth is flat, which naturally makes it wider than the lower portion of the bag which is rounded out because it is filled. This provides the ears at the ends of the top which make handling so much easier. Four to 6 bags can be sealed per minute. The operator uses a foot control, leaving his hands free.

More Efficient Carboy Handling

A new carboy hand truck placed on the market by Lewis-Shepard Company, Watertown, Mass., is mounted on the new small size pneumatic tires which makes an extremely easy running truck over all floor conditions. In operation, the carrying arms are spread apart by depressing the foot lever, conveniently located just over the axle. The truck is run astride the carboy with the arms underneath the side cleats. By depressing the lower foot lever the arms are drawn in securely against the carboy sides by coil springs and the operator, by bearing down on the truck handles, raises the carboy to carrying position. This truck enables one man to move carboys with safety and dispatch.

Unusual Laboratory Centrifuge

New Sharples Laboratory Super Centrifuge makes available an extremely high separating force and unusually smooth and efficient performance for certain laboratory operations: (1) sedimentation of solids from liquids (2) clarification of liquids (3) separation of immiscible liquids occurring as mixtures and emulsions. These operations are performed continuously. Liquid material is introduced into rotating bowl where it is subjected to a separating force as high as 62,000 times the force of gravity. It is then discharged continuously. Solids collecting in rotating bowl are periodically removed. Batch operations can also be handled effectively. Frame of the new models is similar to the large size Sharples Commercial Centrifuges so that the turbine head or motor drive head can be installed. Separator bowl is of the adjustable type to allow great flexibility in handling. New Laboratory Super Centrifuges can be furnished for either steam or compressed air turbine drive, or motor drive. Turbine driven model develops 62,000 times force of gravity, operating at 50,000 r. p. m. It requires steam or air pressure of 30 lbs. sq. in. and consumes 90 lbs. of steam per hour or 24 cu. ft. of free air per minute. Motor driven model operates at 25 000 r. p. m. and develops a centrifugal force of 15,500 times gravity. A vertical mounted motor driving through adjustable friction surfaces is used. Motors are Universal type, interchangeable for use on D. C. or single phase A. C. of any cycles from 60 to 25. They are ⅛ h. p. furnished for either 110 volts or 220 volts.

Equipment Booklets

E65. The Allen Manufacturing Co., Hartford, Conn. New booklet, prepared by a leading firm of engineers for the Allen Manufacturing Co., showing the holding power and proper sizes of hollow screws to use. It is reported that nothing has been published along similar lines in the past.

E66. Blackmer Rotary Pump Co., 1809 Century ave., Grand Rapids, Mich. New 32-page booklet which describes in detail complete line of Blackmar pumps with capacities ranging from 5 to 500 gals. per minute. Specially well-illustrated.

E67. The Exact Weight Scale Co., Columbus, Ohio. A specially prepared prospectus for the chemical and allied industries describing the variety in Exact Weight Scales, with capacity ranges from 4-oz. to 500 lbs. Producers with weighing problems will find this booklet of special interest.

E68. General Electric Co., Schnectady, N Y. "Spots of Heat" is a booklet cleverly made up in movie-strip showing how small heating problems in plants are successfully handled.

E69. Greene, Tweed & Co., 109 Duane st., N. Y. City. A new folder describing the various types of "Basa" rawhide faced hammers employed in manufacturing and processing plants.

E70. The Harnischfeger Corp., 4400 W. National ave., Milwaukee, has a new bulletin on "Hoists" (RH-1) for every plant and purpose. This interesting publication treats upon the application of hoists to both general and specific problems. Profusely illustrated in color with photographs of installations and diagrams explaining simplified construction and operation, it covers the vital points in modern hoist design. Bulletin lists the ratings and operating ranges for type "R" hoists along with specifications and electrical accessories.

E71. The International Nickel Co., 67 Wall st., N. Y. City. Fall edition of "Inco" describes use of Monel metal in the latest industry in "Gin Comes Out of the Bath Tub." This is but one of a number of articles on the newer uses and applications of Monel metal. Another specially interesting article is that of Specializing in Difficult Separations by Carl J. Lamb, centrifugal engineer, The Sharples Specialty Co.

E72. Link-Belt Co., 519 N. Holmes ave., Indianapolis, Ind. New illustrated catalog on flexible shaft-couplings. Three different types are tabulated and priced, with special emphasis on type "RC" which employs Link-Belt Silver-link Roller Chain for flexibly connecting the 2 toothed coupling halves. Both revolving and stationary types of automatic-lubricating casings are included. Selection of the right coupling for the work is made easy by a series of conveniently arranged tables.

E73. Nason Manufacturing Co., 71 Fulton st., N. Y. City A new 20-page catalog is unique in that it explains, and also gives the solution as experienced by companies in various industries, and likewise because it is the only catalog of its kind which describes and illustrates a complete line of steam traps; bucket, ball float return etc., for all purposes. Of particular interest is its explanation of the large savings that can be effected in most every kind of plant. Some of the many products featured are the different types of "Detroit" Return, Vacuum, Combination, and Separating Traps; also "Detroit" Receivers which are now manufactured exclusively by the Nason Manufacturing Co. Other products described and illustrated are: Ideal *Ball Float* Steam Traps and other Nason items such as their various type Steam Traps, Feeders, Controls, Glue Heaters, Gauges, Cocks, Quick-Opening Valves, etc. Many ready reference Tables are also shown. This Catalog is a valuable aid to the plant engineer, since it enables him to obtain all the important information desired quickly and conveniently.

E74. Republic Flow Meters Co., 2240 Diversey Parkway, Chicago, have issued 3 new booklets: No. 800 describes Republic Multi-Point Draft and Pressure Indicator; Bulletin No. 900 describes Republic Remote Liquid Level and Pressure Recorders and Indicators; and a profusely illustrated 24-page booklet describing the new Republic Flow Meter "with cartridge sealed elements." Complete engineering data is given.

E75. The Sharples Specialty Co., 23rd and Westmorland aves., Philadelphia. A 4-page leaflet describes the new Sharples Laboratory Super Centrifuge, giving complete data and uses.

E76. Surface Combustion Corp., Toledo. Latest 4-page broadside discusses SC standard rated furnaces (electrical) and shows a number of typical installations.

E77. New Jersey Zinc Co., 160 Front st., N. Y. City. Latest issue of *The New Jersey Zinc Alloy Pot* admirably describes a number of new and unusual uses for zinc.

E78. Fisher Scientific Co., Pittsburgh. *The Laboratory*, latest issue, has more than the usual number of new equipment, new methods of value to the analyst and laboratory worker.

E79. Pittsburgh-Des Moines Steel Co., Neville Island, Pittsburgh. Technical Bulletin No. 3304 is an informative and useful report covering exhaustive and practical large scale tests of the durability of almost 200 kinds of paints and other coatings materials, offered for use on interiors of steel water tanks. A table is printed which the paints and coatings used are given a per cent. rating, (1) in order of their durability and relative cost per gallon and per unit of coverage; (2) by name of product and producer.

E80. Dearborn Chemical Co., Straus Bldg., Chicago. A new booklet describing use of "No-Ox-Id (rust preventative) on metallic equipment for the prevention of corrosion.

E81. Quigley Co., 56 W. 45 st., N. Y. City. "Preventing Corrosion with A. A. A Coatings is a worthwhile booklet for the plant manager harassed with surface problems from corrosive chemical fumes. Many colors are available for distinctive paintings of various pipe lines.

E82. Republic Steel Corp., Youngstown, Ohio. Form ADV 222-B—"The Technical Story of Toncan Iron Pipe" is of special interest in plant managers dealing with pipe corrosion problems.

E83. Structural Gypsum, 535 5 ave., N. Y. City. New booklet describes Gypsteel Gypsum Planking. Wherever a re-roofing job is needed or new plant construction contemplated, this booklet should be consulted by plant executives before O'K'ing specifications.

Chemical Industries,
25 Spruce Street,
New York City.

I would like to receive the following booklets specify by number.

.....

.....

Name.....

Title.....

Company.....

Address.....

Equip. Feb.

Chemical Markets & News

Proposed Shipping Code Loaded With "Dynamite," Opposing Groups Charge—Foreign Trade Jeopardized —Phosphate Rock Producers Represented at Hearing.

Chemical industry quite unexpectedly is facing a new, and in several ways, novel NRA situation. Absorbed for 8 months with writing one major and a hundred and one minor codes so that they might prove acceptable to labor and consumer boards and finally to NRA officialdom, chemical executives now find it necessary to wage serious battle against a proposed code of another industry. Experienced traffic men within the industry, reading "between the lines" of the shipping code, are deeply concerned. So fraught with unpleasant possibilities is the proposed code that the Phosphate Rock Export Association sent Cyanamid's general traffic manager, A. D. Whittemore, to Washington to protest a number of the proposed provisions.

Specifically those outside of the shipping industry itself are attacking most vehemently Article II, which defines various terms such as owner, operator, agent, etc.; Article III which defines to whom the code shall apply; and Article VII, which is innocuously labeled in the proposed code as "Stabilization and Regulation."

To appreciate the dangers for the chemical industry in the suggested provisions, it is necessary to outline the present set-up. Shipping industry may roughly be divided into 3 groups: (1) Foreign flag lines, such as Cunard, North German Lloyd, etc.; (2) American Steamship Owners' Association; and (3) independent operators. Under the Shipping Board Act operators have been permitted to band together into groups or "conferences" and to fix rates arbitrarily. The only requirement being that such rates must be filed with the Board. By so doing steamship operators have been able to escape the rigors of the Sherman Anti-Trust Law. The most effective check on exorbitant rates has been the presence of independent operators who are not obliged to maintain conference rates. Also, to some extent, a check has been had through the possibility that if rates were forced too high that large shippers would enter into the shipping field in self-defense. Under the wide sweeping definition of those who must come under the code the ship-owner heretofore operating independently of the various conferences will be forced into such agreements, and competition will cease to exist. A number of the larger manufacturing enterprises in the U. S. have built up shipping subsidiaries and do most of their own shipping in their own boats. Quite naturally such companies are not adverse to higher rates as these would give them a decided competitive edge over producers not similarly equipped.

A. D. Whittemore, Cyanamid's traffic manager, ably disclosed vicious proposals of the steamship owners

Pierre S. du Pont, NRA Industrial Advisory Board chairman, before the American Arbitration Association: "I feel that the result of the National Labor Board's efforts will do away with strikes."

Dr. Herbert Levinstein before the Institute of Chemistry, London: "Let us not talk of the Japanese as mere exploiters of cheap female labor, for their work people are well treated and contented. Theirs is no pinchbeck industry, but one armed with every weapon of the modern industrial armory."

Dr. James Byrant Conant, Harvard president and outstanding chemist, before the Harvard Club of N. Y.: "An intellectual career open to the talented, and really open to all, will provide, perhaps, in the next twenty-five years in this country a group of creative workers which will make permanent contributions to civilization of the greatest significance.

Article III, Section 1 of the proposed code reads as follows: "This code shall apply to (a) all owners, operators, and agents of all vessels of all flags engaged in foreign and domestic commerce of the United States, and (b) all employers connected with transportation by water as freight forwarders, Custom House, freight and chartering brokers, operators of water terminal facilities, or contracting stevedores . . . "First question naturally asked by the uninitiated is how vessels of foreign register can be made to comply with an NRA code. That this is why the agent, freight forwarder, stevedore, etc., are included in the code, for it is expected that foreign steamship companies will be forced to join by using the services of these groups.

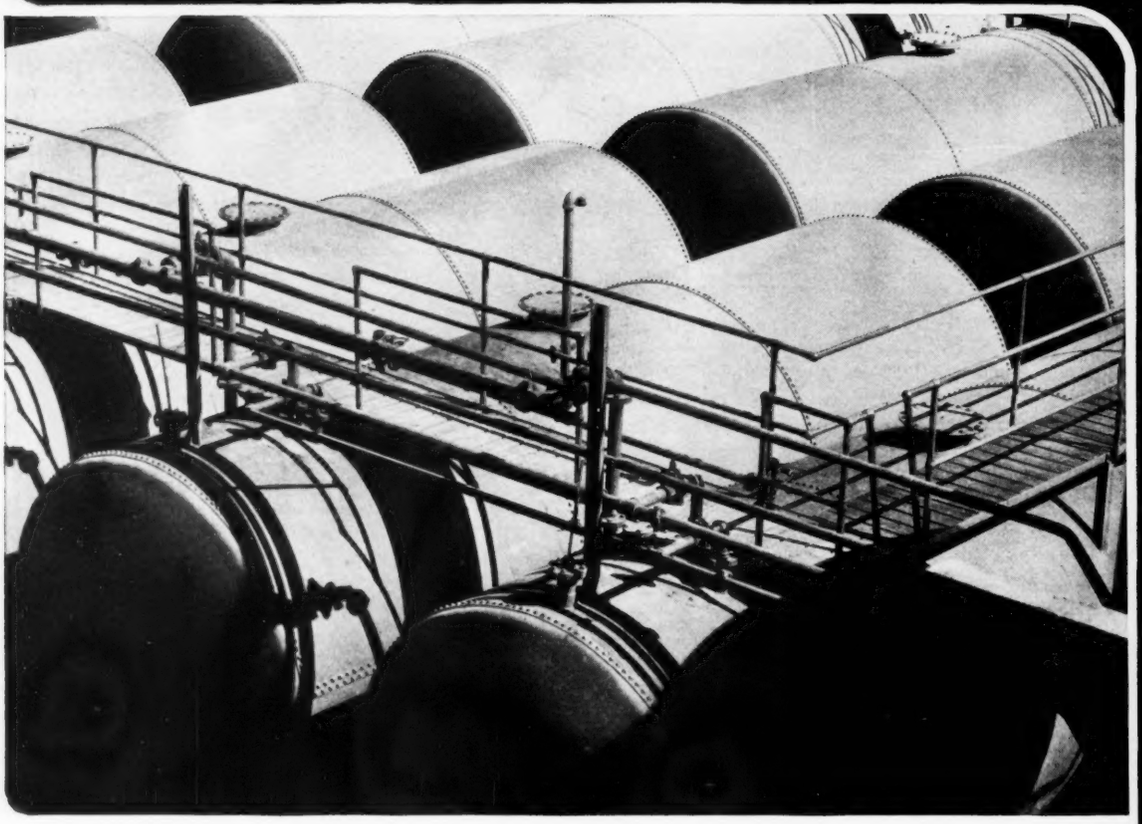
Article VII Reads—

Opponents of the code did not hesitate to point out at the hearing the danger to our foreign business. Article VII, Section 2 (a) reads: "Members of each division and subdivision shall, by actions taken in the appropriate manner respectively authorized by the provisions of Sections 6, 7 and 8 of Article IV hereof, adopt codes supplemental to this general shipping code, each to be appropriately designated (name of division or subdivision) Division Code, which may prescribe minimum rates, fares and charges, and rules and regulations, to be charged and enforced by, and establish standards of fair competition for, the Members of the Industry, and may provide for the regulation of any other matter with which the division or subdivision may be especially concerned . . ."

Those appearing in opposition pointed out that permitting the steamship companies to prescribe minimum rates was directly opposite to the practices of the Interstate Commerce Commission which is permitted to fix only the maximum rates that may be charged. The very strong possibility of allowing steamship companies such power will be to force out eventually weaker competition, for shippers are not likely to use slower boats and to countenance uncertain sailing and arriving dates unless some compensation is made in the

DOW CARBON BISULPHIDE

99.99% PURE.



DOW Carbon Bisulphide is a product of high purity, testing better than 99.99% CS_2. It is free of color and objectionable foreign odors.

Dow Carbon Bisulphide 99.99% Pure has gained full acceptance and wide use as a raw material in the manufacture of viscose rayon and in many processes in the rubber industry.

This product is used extensively in chemical manufacture. It is an efficient fumigant for grain and soil and an excellent solvent in the recovery of fats, oils, resins, spices and waxes.

Dow Carbon Bisulphide 99.99% Pure may be had in any quantity from drum lots to tank cars, stocks for small lot shipments being maintained in principal commercial centers. Let us quote on your requirements for Dow Carbon Bisulphide and other industrial chemicals.

DOW INDUSTRIAL CHEMICALS INCLUDE:

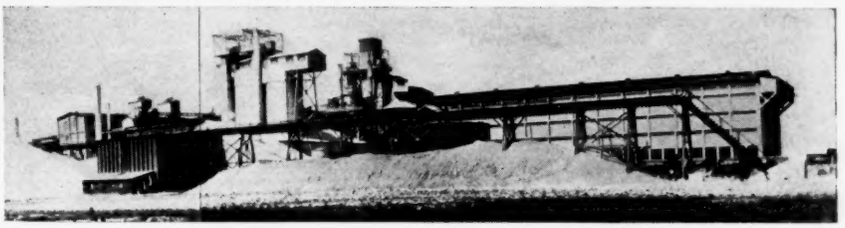
ANILINE OIL
CALCIUM CHLORIDE
Flake 77-80% Solid 73-75%
CARBON
BISULPHIDE 99.99%
CARBON
TETRACHLORIDE 99.9%
CAUSTIC SODA
Flake and Solid
CHLOROFORM
EPSOM SALT TECHNICAL
ETHYL BROMIDE
ETHYL CHLORIDE
FERRIC CHLORIDE
FERROUS CHLORIDE
MAGNESIUM CHLORIDE
MONOCHLORBENZENE
MONOCHLORACETIC ACID
PHENOL
SODIUM SULPHIDE
SULPHUR CHLORIDE

Meet your friends at the 9th annual dinner of the Drug and Chemical Section of the New York Board of Trade at the Hotel Waldorf-Astoria on March 8th.

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

TRADE DOW MARK

way of lower rates. Opponents also point out that the last part of the Section which reads "and may provide for the regulation of any other matter with which the division or subdivision may be especially concerned" is too broad and vague, and could easily, for example, be used to prevent a shipper from entering into the shipping field with a boat or fleet if he felt that the rates being charged were excessive.



Phosphate rock industry (centered in Florida) for years dominated world trade. Development of African deposits (Chemical Markets, p. 250 and 252, Sept.,'31) brought on a bitter struggle for European tonnage. Marketing agreement has just been ratified by both groups, but higher freight rates will add further burden to U. S. producers. Investments, in land and equipment, running into millions are at stake.

Concern is felt for our export business when foreign steamship owners are made an important factor in determining rates on materials leaving this country. At the moment the foreign and American operators are said to be locking horns behind closed doors over who shall have the most influence in determining these rates, the former insisting that because of their greater tonnage that they should be permitted to dictate what is reasonable and fair. It requires little imagination, opponents of the code point out, for foreign steamship interests, backed by government subsidy or closely allied with manufacturing concerns in their mother countries, to insist on freight rates that could easily be bettered by shippers in foreign countries. Opponents of the code pointed out at the hearing that the spirit of the NRA (clearly stated in sentence 2 of the Act) would be violated by the proposed code for NRA's definite purpose is to increase our business so that greater numbers can be gainfully employed.

In general, those attacking the proposed code in its present form insist that it is unfair and discriminatory to permit steamship operators to be both judge and jury as to what is fair or unfair in rate questions. Operators in reply insist that it would be poor policy on their part to raise rates beyond the point of reasonableness, or to permit the loss of our foreign trade because of high rates. Those opposed answer that however noble and self-sacrificing the intentions of the operator are that to carry the possibilities under the code to their logical conclusions American manufacturers could be bled to the point where most if not all of the profit would be going into the hands of the steamship operators.

Effect On Domestic Prices

Nor has the question to do only with our foreign markets. Mr. Whittemore pointed out at the hearing that approximately 40% of our total phosphate rock business is in Europe or in export trade. He also pointed out that the cost of producing rock is directly proportional to the volume and that if we should lose our export markets that the cost of fertilizer to the American farmer is bound to be higher. He pointed out very forcibly that phosphate rock is a low grade and relatively low priced commodity shipped in bulk and that the successful marketing and distributing of this commodity is largely dependent upon water transportation. What the American producer of rock is able to pay in the way of freight rates is governed solely on what rates the African, Pacific Island, and other producing sections of the world enjoy.

Generally speaking, all industrial chemicals are both bulky and heavy and relatively cheap. The industry is, therefore, likely to feel the sting of advanced rates much greater proportionately than many other industries. Indications are that the proposed code is likely to receive administration blessing unless greater opposition is raised by shippers themselves, who, strangely with a few notable exceptions such as the phosphate rock producers, have shown but relatively little interest or understanding of the dangers now present in the proposed code. Other large exporting divisions of the industry, such as sulfur and naval stores, have registered no organized protest.

Foreign Trade

Our December exports amounted to $192,000,000, an increase of $8,000,000 over November, while imports rose by about $4,500,000, to $133,000,000. Thus the "favorable" balance for December was $59,000,000.

Imports of chemical and related products amounted to $5,438,000 in December against $5,290,000 in November; fertilizers in December to $2,392,000 against $2,223,000 in November. Exports of chemical and related products totalled $8,329,000 in December and $7,322,000 in November. Coal tar imports to $1,322,000 in December against $1,115,000 in November; pigments, paints and varnishes, $1,629,000 against $1,145,000; fertilizers and materials, $902,000 against $961,000; naval stores, $1,378,000 against $1,185,000; sulfur, $661,000 against $1,092,000.

Further evidence of expanding confidence in world economic recovery and faith in the continued improvement of its international trade is to be found in the record of increased chemical exports from all major producing and exporting countries for the 1st 9 months of '33—an improvement that finds its backing in a larger demand for industrial chemicals because of the general depletion in stocks and the betterment in textile, soap, and other chemical-consuming industries. Such artificial trade barriers as quotas, licensing systems, exchange restrictions, and the like had comparatively little effect on total chemical exports, since the adverse results on one commodity's export was, in the main, offset by favorable results on another commodity.

[All values are in United States dollars, using as the conversion figure the average of monthly exchange rates for January-September 1933.]

[000 omitted from values]

	Imports (Jan.-Sept. '33)		*Exports (Jan.-Sept. '33)*	
Countries	*Value*	*% change from '32*	*Value*	*% change from '32*
Ger.	$45,945	+10	$134,586	+7
U. S.	61,700	+11	75,500	+6
U. K.	41,671	—2	54,587	+3
France:				
Foreign	46,400	(1)	45,800	(1)
Colonies	5,327	(1)	10,400	(1)
Belgium	26,500	+22	34,400	+21
Switz.	14,500	[2]+7	20,800	[2]+21
Japan	28,657	(3)	11,596	(3)
Can.	17,841	—16	8,453	+14

[1]Measured in gold values, both imports and exports increased but slightly. In quantities, imports from foreign countries remained about the same, but imports from the colonies were up 14%; exports to foreign countries increased 14%, and to the colonies 23%.

[2]Measured in gold, the value of imports was 6% less, and of exports 7% greater.

[3]Measured in yen, imports increased 17% and exports 65%. Measured in U. S. dollars, imports were 3% less and exports 35% more.

Japan and the Gold Standard

Changes from the corresponding period of '32 are most strikingly illustrated by Japan, which made the largest value increase (on a yen basis), as a result of its embargo on gold exports since '31, its increase in plant capacities, and its devaluation of the yen. Next may be noted the effect of the Imperial Conference on Canadian purchases of chemicals from the U. S., as apparent in the 16% drop in Canada's total chemical imports. In the case of the U. S., progress was outstanding in October and November for both imports and exports; a few commodities, notably carbon black, attained new high export levels.

First 9 months of '33 continued Germany's record as the largest exporter of chemical products, advancing over the '32 period by 7% in value, but declining 13% in quantity Its imports on the other hand, advanced 26% in volume and 10% in dollar value, but declined 4% in mark value. Purchases from U. S. of chemicals for which Germany is wholly or largely dependent on foreign sources was progressively stimulated by the depreciation of the dollar, particularly in the case of carbon black, and also in turpentine,

rosin borax, sulfur, phosphate rock, coal tar, and pitch and licorice extracts.

British-made chemical products continued to rank third in world trade during the 1933 period. France's imports of chemicals from its colonies (mostly phosphate, essential oils, and other native raw materials) advanced 14% in quantity while imports from foreign countries remained about the same. Exports to its colonies increased 23% and to foreign countries 14%.

Belgium retrieved some of its trade lost in '32, through greater imports of crude materials (phosphate rock, potash, sodium nitrate, borax, and other industrial chemicals, and carbon black and aniline dyes) and through exports one-fifth greater than in the '32 period despite declines, in three leading items (superphosphates, ammonium sulfate, and calcium nitrate).

Switzerland also improved its export trade considerably, but its imports declined. Its 25% advance in quantity of exports resulted from shipments of heavy commodities (fertilizers, coal tar, and calcium carbide).

Japan, until a few years ago, was an important market for foreign chemicals. Expansion of the Japanese chemical industry is notably evident in the character and extent of its imports; coal-tar distillates multiplied over fourfold from '31, carbon black nearly doubled, crude sodium nitrate increased 19%, but crude ammonium sulfate declined more than half, and caustic and other sodas, particularly the bicarbonate, dropped markedly. Dyestuffs industry has so expanded that Japan now exports large quantities of low-priced dyes, particularly coal-tar dyes that have practically doubled their exports in quantity and value since '31, while their imports have dropped in the same proportion.

As a result of the Imperial Conference, Canadian imports of chemicals from the U. K. were 11% larger in the 1st 9 months of '33 than in the '32 period, though total chemical imports declined 16% and those from the U. S. were 20% less. For such commodities as can be more easily transported across the border in tank cars than by ocean carriage, U. S. maintained its position as supplier, but losses in other transportable items were large.

Foreign

Two du Pont officials are now in Argentina, to study possibility of expansion of company's Argentine subsidiary. However, company labels as "over exaggerated" reports that a huge expansion is definitely contemplated at this time.

"Jasper E. Crane, vice-president, who a few weeks ago withdrew from the state relief activities to make a business trip to South America, is now in Buenos Aires, accompanied by Wendell R. Swint, director of the du Pont company's foreign relations departments." A statement by the company reads:

Jasper E. Crane

"Presence of these 2 du Pont officials in the Argentine has led to much speculation and exaggerated reports sent by cable of plans for great activity by du Pont in South America. Du Pont is already represented in the Argentine by E. I. du Pont de Nemours & Co., Argentina S. A. Commercial & Industrial, which conducts the activities of 2 merged companies, one of which has been engaged for many years in importing and processing sulfur in various forms and mixtures, and the other manufacturing carbon bisulfide. In addition, Argentine subsidiary acts as distributor for du Pont products manufactured in the United States.*

New Nitrate Law

New law reorganizing Chilean nitrate industry liquidates Cosach and creates new company known as Chilean Nitrate & Iodine Sales Corp., which is controlled by the government and which has a monopoly of the sale of both nitrate and iodine.

Under the new law production of nitrate and iodine will be carried on by private, independent units, but exportation and trade in both products are declared to be a state monopoly which may be leased for a period of not more than 35 years to Chilean Nitrate & Iodine Sales Corp. Government is to receive 25% of the profits of the corporation. Rest goes to producing companies, with the provision that it must be used to meet service on prior secured bonds before it may be applied to any expenses other than what is defined as the industrial cost. This is the price at which the corporation is to buy the nitrate and iodine from the producers, and includes actual operating expense and necessary repairs, but excludes such items as amortization, depletion, interest, and service of debts.

Law is similar to that proposed by Finance Minister Ross, with exception that instead of the government having control over matters of policy only, law provides for virtual operation of the corporation by the government. Control is vested in a board of 10 directors, 5 representing the government and 5 the industry, plus the president of the corporation, who must be a Chilean.

German Syndicate Reorganized

As a result of negotiations in Berlin in January, the German Nitrogen Syndicate has been more or less reorganized. A change in the position was brought about last year by the voluntary co-operation with the Syndicate of the Victor Mining Co. (with which the Klockner Werke A.G. and the Wintershall A.G. are allied), and it became apparent that some modification in the quota arrangements of the Syndicate as regards synthetic nitrogen and coke-oven ammonia was inevitable. New agreement will be in operation until the end of 1940, and recognizes that by-product ammonia must receive special sales facilities, as it is not possible to regulate its output so positively as in the case of synthetic ammonia. It is anticipated that if the outside producers (which represent no more than 2% of German nitrogen production) do not join the Syndicate voluntarily, compulsory provisions of the German Government's new cartel legislation will be brought into effect.

Status of Foreign Potash

British *Manchester Guardian* sees potash syndicate now definitely on the defensive with Spain and U. S. leading the opposition. In the writer's opinion so-called Lugano agreement of '26 (between France and Germany, later extended to include Poland) "has failed irretrievably."†

Correspondent continues: "In the early summer of last year much comment was caused by the very intense price war which broke out for the 1st time on the Dutch market between the local agency of the Franco-German interests and the so-called 'Viska.' Within the space of only a few weeks prices of potash salts with up to 40% K20 were reduced by the Franco-German agency by 40% or more, which meant to the Dutch agricultural industry an economy in fertilizers amounting to about 3,000,000 guilders. A keen price war also was initiated in Belgium, among other countries, with the object of forcing Spain to join the Franco-German-Polish combine.

"Over a considerable period before this negotiations had been conducted as to the quota to be allowed; they led to nothing, for the reason that the Nobel group and the Pechiney group, 2 important concerns which are at present concentrating on the development of Spanish potash and its by-products, have met with great success

*I. C. I. and du Pont on Feb. 8 formed joint stock company with 15,000,000 pesos capital to unify their existing concerns in Argentina. Study of the consolidation of the involved Argentine interests by H. J. Mitchell and Jasper E. Crane, resulted "in a conviction of the favorable economic prospects and future development of Argentine industry." I. C. I. and du Pont also own shares in Canadian Industries

†Spanish Mines Office has fixed maximum production of potash salts for '34 as 500,000 tons (basis of 80-85% potassium chloride) and minimum production as 60,000 tons. Maximum selling price for the home market is to be 5 pesetas per ton f.o.r. mines for salts containing above 41% K_2O down to 2.8 pesetas for salts containing below 21% K_2O. Minimum export price is fixed at 1% above home market price in Spain during previous month. All surplus above the home market needs may be exported.

owing to the possibilities presented by the Spanish potash reserves not only from the geological and chemical aspects but also from the point of view of transport costs.

"Spain will shortly have available for export a quantity such as is normally handled by Germany, namely, more than 1,000,000 tons of crude salt, though in the case of the latter country one has to bear in mind the considerable production of potassium chloride, potassium sulfate, etc. At the same time the Spanish industry is not losing sight of the possibility of producing higher concentrated salts as well as by-products."

England's Alcohol-Gasoline Blend

Petroleum Storage & Finance, England, will shortly market an alcohol-gasoline mixture perfected in conjunction with Distillers Co., which produces the bulk of Great Britain's industrial alcohol. Trade-name—"Cleveland Discol." Benzol will be added to the mixture to secure a premium fuel with a sufficiently high octane rating.*

Golden Jubilee

Society of Dyers and Colorists, London, is planning to commemorate 50 years' of educational work in connection with the manufacture and general application of synthetic dyestuffs. Periods fixed for celebration will extend from May 23 to 26.

Japan's Industry Expands

Japan Soda is contemplating stearine and oleine production. Sono Chemical and the First Pharmaceutical (the 2 Jap lactic acid producers) are said to be carrying large stocks and looking for outside markets. Yedogawa Works is stepping up formic production to 140 tons annually. Hokkaido Butter Manufacturers' Federation has submitted plans to the government to make casein. Only 10% of the total consumption is domestic. The '33 pyrethrum production totaled 6,355 tons, exports for 1st 9 months totaled 3,452 tons, 87% going to the U. S. Methanol production has been started by one plant and 2 others are being constructed.

German Wool Grease

Ed. Muller, G.m.b.H., of Halle, Germany, is one of the largest factors in the German wool grease market and acts as sole concessionnaire on all wool grease products of the largest German wool combers—The Bremier Wollkammerei Blumenthal-Unterweser. In the past year or so the firm of Ed. Muller has entered into the world export markets and is shipping large quantities.

*Standard of N. J. has a minority interest in Petroleum Storage & Finance acquired when it purchased foreign properties of Pan American Petroleum & Transport (Standard of Indiana). Petroleum Storage, is, in fact, a competitor of the Jersey Company's British marketing subsidiary, Anglo-American Oil. Standard of N. J. has consistently fought proposals of alcohol-gasoline fuel mixtures as an aid to the middle-west grain farmer on the grounds of technical unsuitability of the product.

Personnel

George Sykes, U. S. I. executive vice-president and assistant to the president, has resigned to become president of General Wines & Spirits. Mr. Sykes, who has for a number of years been identified in various enterprises with the present executive group dominating Air Reduction and U. S. I., is also a director and vice-president of U. S. Industrial Alcohol Sales, vice-president U. S. Industrial Chemical, vice-president of A. L. Webb & Sons, Inc., and director and vice-president of Cuba Distilling.

Boyer with Filtration Equipment

John W. Boyer has been elected vice-president, in-charge of sales of Filtration Equipment, recently acquired by Cyanamid. He has been with Calco, another Cyanamid subsidiary, for some time. Previously, he was a Monsanto vice-president, in charge of sales development, and before that, with Mathieson.

Spirits Code Authority

Joseph H. Choate, Jr., Federal Alcohol Control Administration chairman, has included among others the following as code authorities of the distilled spirits industry: Dr. James M. Doran (former commissioner of industrial alcohol and now Distillers' Institute head, Major T. P. Walker, S. S. Neuman, Russell R. Brown, H. L. Felton, H. I. Peffer.

Further Changes

Oliver J. Sizelove, well-known electroplating technologist, has joined Frederick Gumm Chemical, Union City, N. J. Peaslee Gaulbert has added J. E. Mueller and G. E. Woodruff to the board. Officers and directors were reelected at the recent meeting. Company plans a new branch at Oklahoma City. Lee H. Lincoln, American Extract vice-president and general manager, has resigned.

Obituaries

Fritz Haber

Fritz Haber, noted chemist, Nobel prize winner in 1918, and the outstanding German technician, who with Dr. Carl Bosch made possible Germany's bid for wide-world supremacy in '14, died in self-imposed exile in Basle, Switzerland, on Feb. 1 at the age of 65.

As a discoverer of the process for fixation of nitrogen, which immensely strengthened Germany's defensive power during the World War, and as the man who otherwise organized chemistry for war

COMING EVENTS

American Ceramic Society, Cincinnati, Feb. 11-16

American Petroleum Institute, mid continent district meeting, Division of production, Biltmore Hotel, Oklahoma City, Feb. 15-16.

American Institute of Mining & Metallurgical Engineers, 143rd meeting Engineering Societies Bldg., N. Y. City, Feb. 19-22.

Technical Association of the Pulp & Paper Industry, N. Y. City, Waldorf-Astoria, Feb. 19-22.

American Concrete Institute, Royal York Hotel, Toronto, Feb. 20-22.

Beer and Wine Show, Grand Central Palace, N. Y. City, Feb. 19-24.

National Wholesale Paint Association, 20th Annual Convention, Drake Hotel, Chicago, Feb. 19-21. E. R. Drake, sec., 2201 N. Y. ave., N. W. Washington, D. C.

British Industries Fair, White City, London, Feb. 19-March 2.

A. S. T. M. Regional Meeting, Washington, March 7.

American Management Association, 4th Annual Packaging Exposition, Hotel Astor, N. Y. City, March 13-17.

Fashion Group, "Fashions and Interior Decorations Developed in Man-Made Materials, 30 Rockefeller Plaza, Rockefeller Center, March 15-April 14.

American Association of Petroleum Geologists, 19th Annual meeting, Baker Hotel, Dallas, March 22-24.

A. C. S. 87th Meeting, St. Petersburg, Fla., Hotel Vinoy Park, week of March 25.

Third Technical & Chemical International Congress of Agricultural Industries, Paris, week of March 26.

Industrial Arts Exposition, National Alliance of Art and Industry, 30 Rockefeller Plaza, Rockefeller Center, April 1-30.

Canadian Institute of Mining & Metallurgy, annual meeting, Quebec City, April 3-5.

American Drug Mfrs. Association, Greenbrier, White Sulphur Springs, week of April 16.

Knitting Arts Exhibition, Commercial Museum, Phila., Apr. 23-27.

Electrochemical Society & American Ceramic Society, joint meeting, Asheville, N. C. April 26-28.

U. S. Chamber of Commerce, Washington, May 1-4.

A. C. S. 12th Midwest Regional Meeting, Hotel Muehlebach, Kansas City, Mo., May 3-5.

Fourth Annual National Premium Exposition and Convention, Palmer House, Chicago, May 7-11. A. B. Coffman, Exp., Mgr., 35 East Wacker Drive, Chicago.

Tanners' Council of America, Spring Meeting, Greenbrier, White Sulphur Springs, W. Va., May 10-11.

American Institute of Chemical Engineers, tentative, Waldorf Astoria, N. Y. City, May 14-21.

National Fire Protection Association, Atlantic City, May 14-18.

Achema VII Exhibition of Chemical Apparatus & Plant, Cologne, Germany, May 18-27.

American Petroleum Institute, mid-year meeting, Pittsburgh, William Penn Hotel, May 22-24.

Canadian Chemical Association, Royal York Hotel, Toronto, June 4-6.

Cottonseed Products Association, New Orleans, June 4-5.

American Association of Cereal Chemists, Royal York Hotel, Toronto, June 4-7.

Ninth International Congress of Pure & Applied Science, Madrid, Spain, June 10-17.

Eleventh Colloid Symposium, Madison, Wis., June 14-16.

National Fertilizer Association, 34th convention, White Sulphur Springs, June 18-20.

National Association of Purchasing Agents, Cleveland, June 18-21.

American Society of Refrigerating Engineers, semi-annual meeting, Skytop, Pa., June 21-22.

A. S. T. M. Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, June 25-29.

Technical Association of the Pulp & Paper Industry fall meeting, Portland, Ore., Aug. 28-31.

American Gas Association Convention and Exhibition, Atlantic City, Week of Oct. 29.

National Paint, Varnish & Lacquer Association, Annual Convention, Washington, fall of the year, date to be announced.

LOCAL

Society of Chemical Industry, Chemists' Club N. Y. City, Feb. 16.

American Association of Textile Colorists & Chemists, Philadelphia Section, Penn. Athletic Club, March 2.

Fifth Annual Greater N. Y. Safety Conference, Hotel Pennsylvania, March 6-7.

Ninth Annual Dinner, Drug, Chemical & Allied Section, N. Y. Board of Trade, Waldorf Astoria, March 8.

Nichols Medal Meeting (4 N. Y. Sections), technical societies, March 9.

American Institute of Chemists, N. Y. Section, Chemists' Club, March 16.

American Society of Refrigerating Engineers N. Y. Section, March 22.

service, he occupied a privileged position. He resigned last year, however, his professorship at Berlin University and as director of the Kaiser Wilhelm Institute for Inorganic Chemistry, as a protest against Nazi demands for the dismissal of

Fritz Haber

some non-Aryan coworkers and assistants at the chemistry institute, including Dr. Herbert Freundlich, who is now in this country.

In the World War Dr. Haber was chief technical adviser to the German gas service. In an opinion expressed publicly in 1921 he said that had the commanders launched a huge general gas attack in '15, as he advocated, Germany would have won the war. "I was just a professor, so the Generals would not heed my words. Later they admitted that I was right," he asserted.

The Haber process for making synthetic ammonia out of hydrogen and nitrogen was practically perfected early in '14. It permitted Germany to continue the war after she had been shut off from Chilean nitrate supplies.

Experiments of Dr. Haber which attracted popular interest were those in which he investigated possibilities of extracting gold from sea water. His work was considered the supreme effort to realize this old dream. With all the resources of the Kaiser Wilhelm Institute behind him, he labored with his usual patience and thoroughness, then recorded his conclusions in a pessimistic paper which has become a kind of classic in technical literature. He decided that one has a better chance of finding the needle in the haystack than of reducing gold from sea water profitably.

Dr. Haber was born at Breslau. He was educated at the universities of Berlin, Heidelberg and Charlottenburg. From 1896 to 1911 he was on the faculty of the Technical Hochschule at Karlsruhe. Thereafter he was Professor of Physical Chemistry and director of chemical investigations at the University of Berlin. His first invention of the ammonia-making process was achieved in 1911 in collaboration with Dr. Carl Bosch.

In September, '24, Dr. Haber spoke at the Franklin Institute centenary celebration in Philadelphia, where he pleaded for international accord among scientists.

Henry Pfaltz

Henry Pfaltz, 72, former Pfaltz & & Bauer president, died Jan. 29. He was born in Offenbach, Germany, Dec. 31, 1862, and came to the U. S. in 1886. In 1900 he founded the firm of Pfaltz & Bauer, specializing in the importation of chemicals, essential oils, and raw materials. From the time of the incorporation of the firm in '13, Mr. Pfaltz acted as its president until his retirement in '27. His widow, Lily M. Pfaltz, a daughter and 2 sons survive.

Dr. Edward W. Washburn

Dr. Edward W. Washburn, 52, chief chemist of the Bureau of Standards since '26, prominent in chemical society circles for the past 2 decades, died suddenly of a heart attack in Washington on on Feb. 6.

Born in Beatrice, Neb., May 10, 1881, he was a graduate of the University of Nebraska and received a Ph. D. from M. I. T. in '16. He was a member of the faculty at the latter institution from '08 to '16, when he became head of the Department of Ceramic Engineering at Illinois. In '22 he was appointed editor of *The International Critical Tables*, published under the direction of the National Research Council. He was a member of the National Academy of Sciences.

In the last year of the World War Professor Washburn served as vice chairman and acting chairman of the chemistry division of the National Research Council. In '22-'23 he was chairman. On several occasions he was a delegate to international conventions of chemists in Europe. He was chairman of the International Commission on Physico-Chemical Standards.

Professor Washburn belonged to various scientific societies, also the Society of Mayflower Descendants, and the Phi Lambda Upsilon and Sigma Xi fraternities. His book "Principles of Physical Chemistry," 1st issued in '15, attained a 2nd American edition in '21 and a French edition in '25. Dr. Washburn married Miss Sophie de Veer of Boston. She died 2 years ago. Four children survive him.

George W. Kenyon

George W. Kenyon, 84, former chairman of the old General Chemical Co. previous to its entrance into Allied, died in Brooklyn Dec. 28 after an illness of 2 months. He retired from all connection with General Chemical 15 years ago.

Other Deaths of the Month

George Henry Eaton, 63, former A.A.C. traffic manager, died Dec. 28. During the War he was chairman of the New England freight committee. Curtis L. Furlong, 62, for many years Merrimac's credit manager, died Dec. 29. John Gleichmann, special Philadelphia General Chemical representative, died suddenly Jan. 9. Andrew Squire, member of the executive committee of Carbide and also a director, died Jan. 5 at his home in Cleveland. Ida Hildreth Calvert, wife of Arthur L. Calvert, president, Calvert Aniline & Chemical, Cincinnati, died Jan. 13. Dr. Otto V. Martin, 41, chief chemist, Texaco Salt Products, died Jan. 2 at his home in Tulsa.

Personal

Dr. and Mrs. Howard Victor Dutrow of Dayton, O., have announced the marriage of their daughter Mary Katherine to Harry Leigh Derby, Jr., on Jan. 20. After a brief wedding trip Mr. and Mrs. Derby will return to make their home in Chicago, where Mr. Derby is in charge, as District Manager, of American Cyanamid & Chemical.

The "Passing Throng"

Percy C. Magnus has been re-elected president of the N. Y. Board of Trade. Charles L. Huisking sailed in January on one of his periodical European trips. Robert T. Baldwin spoke before the Montreal Section of the Society of Chemical Industry on "Current Trends in U. S. Chemical Industries." Gen. Herman A. Metz was guest of honor at the recent Drysalters' dinner. Calco's chief chemist, M. L. Crossley, and Harden F. Taylor, president, Atlantic Coast Fisheries, told a joint meeting of the Chemistry Teachers' Club of N. Y. and the N. Y. Section of the American Institute of Chemists "What's Wrong With Chemical Education."

Dr. Gustav Egloff, Chicago Chemical Society president, and director of Universal Oil Product's laboratory, and Dr. Ellery H. Harvey, Montgomery, Ward research director, were on the air Jan. 3. Former spoke on "Chemistry and Industry" and the latter on "Application of Chemistry to Merchandizing." George A. Whiting, Standard Phosphate & Acid Works' president and a well-known yachting enthusiast, has purchased the "Dauntless". Samuel Cabot, is one of 13 nominees for overseer of Harvard College. Carbide's Cressy Morrison was recently elected to the American Tariff League's board of managers. Elon H. Hooker assailed the St. Lawrence waterway project in a recent speech before the N. Y. State Secretaries' Conference.

A laboratory courtship terminated Jan. 12 when Logan Grupelli, National Oil Products' manager of technical sales, and Miss Dorothy Potter, formerly in the research laboratory, were married. Mr. Grupelli's article "Selling Chemical Specialties" appeared in the Nov. '33 issue of CHEMICAL INDUSTRIES. Robert

I. Wishnick, president, Wishnick-Tumpeer, and Mrs. Wishnick sailed Jan. 20 for a 6 weeks' European trip. Pittsburgh A. C. S. Section has selected boiler-water expert, Dr. Ralph E. Hall, director, Hall Laboratories, as recipient of the 1st Pittsburgh Award (gold plaque, on which the relation of chemistry to industry is symbolized artistically). The Crucible, Section publication for January contains several articles on the achievements of Dr. Hall, including 1 by Mellon Institute's Hamor. Assistant chemical director of the Bell Laboratories, Dr. Robert M. Burns, spoke on Jan. 26 at Carnegie Tech. on "The Corrosion of Metals." A. E. Marshall, consulting engineer and the new A. I. Ch. E. president, spoke before the Franklin Institute Jan. 11 on "Modern Glass Technique." Cyanamid's president, William B. Bell, is in Europe.

Washington

After months of negotiation basic code of the chemical industry submitted by the Chemical Alliance has received approval from Administrator Johnson and was transmitted to President Roosevelt for final administration blessing on Feb. 2.*

Berry Succeeds Williams

General Williams, who in the past 5 months has become well known to the chemical, paint, varnish and lacquer, fertilizer and other industries allied to the chemical, in his capacity as NRA division administrator, has been forced to yield his position temporarily due to illness in his family. His successor, at least temporarily, is Major George L. Berry, Pressman, Tenn. Major Berry is president of the International Pressman's and Assistant's Union. He joined NRA early in its period of formation as a member of the labor advisory board. He was later appointed to the National Labor Board. It is expected that in his new position he will relinquish his labor board posts.

Said NRA head, General Johnson commenting upon Major Berry's appointment: "He has the confidence of both industry and labor. In the whole course of this administration I have known nobody who more fully understood or who was more devoted to the President's program. We cannot here appoint crusaders for any particular point of view but, after consultation with leaders of every faction, I have been advised that Major Berry's appointment will be welcomed by all groups."

30 Hour Week?

NRA Administrator Johnson has proposed shorter working hours in the codes in an attempt to take up the remaining slack in unemployment. Higher wage minimums will also be discussed by the General at a meeting of code authorities to be held early in February. A. F. L.'s recent report on business charges that in some instances buying power is now showing a decline because of shortening of work hours under codes so far approved, without a sufficient increase in wages to hold the total pay envelope at former levels.

It is an accepted fact that the deep cut in unemployment has been the result of "made work" of the federal government agencies. NRA officials are looking to the time when this support will end and millions are thrown on private industry for gainful occupations. Labor is demanding the 30-hour week. Indications are that General Johnson will seek, at least in a number of industries, a 32-hour week. He believes in handling hours in multiples of 8 because of so many industries faced with the problem of continuous operation.

Proposes Fertilizer Probe

Rep. Schuyler Otis Bland (1st Virginia Congressional District) introduced on Jan. 29 resolution calling for a committee to investigate all phases of the fertilizer industry.

Bureau of Standards has announced that the simplification and commercial standards work will be continued in cooperation with the American Standards Association and other organizations and groups concerned with such work.

Customs and Tariffs

Question of what constitutes a mixture prepared from phenol was decided adversely to importers on Jan. 2 by the United States Court of Custom and Patent Appeals.

Product, imported by Kuttroff, Pickhardt & Co., consisted of automobile body paint classed as primer surfacer, and consisted of 9% of synthetic resin mixed with pigments, talc, and plasticizers. Resin was made from cyclohexanone, which was derived from cyclohexanol, which in turn was derived from phenol. Government claimed paint was dutiable under coal tar section of the tariff law, (paragraph 28). Importers claimed that the resin content was not prepared from phenol but was two chemical steps removed, each intermediate product being a distinct chemical.

Court noted that Congress used both the terms, "derived from phenol" and "prepared from phenol," in the same act, but concluded that no distinction had been intended; because when this language was originally written, after the close of the war, Congress apparently aimed to give protection to all coal tar products.

Judge Garrett dissented from majority decision asserting that the product is not a mixture but a compound; that it is not prepared from phenol but from a separate chemical; and that the court should not depart from the usual rules of construing a statute because of its idea of the general purpose of Congress.

Another ruling of the Court of Customs and Patent Appeals on Jan. 2 granted Purex Corp., Ltd., permission to register "Purex" as a trade-mark for a bleach and water softener. Registration had been opposed by the United Drug, which uses trade-marks, "Puretest" and "Rexall," on pharmaceutical and chemical products. Examiner on Interferences held that there would be no confusion, but the Commissioner of Patents decided otherwise, and now the court has ruled that registration should be granted because there is no evidence of actual confusion.

Customs Rulings

Gerritt Co., Los Angeles.—Ethyl chloride in glass containers with siphon tops is found to be dutiable separately at 15c per lb. under Paragraph 37 of the tariff, with free entry for the containers.

Burlap bags exported from this country under benefit of drawback equal to the domestic processing tax are not subject to a compensatory tax of like amount if they are returned filled with foreign merchandise. Ruling is similar to one made in the case of cotton bags several months ago and was sought by large manufacturing interests accustomed to buying domestic bags for shipment abroad to be used as containers for material imported by them. Bureau of Internal Revenue has made no change in its decision of last fall denying drawback of processing taxes on bags exported filled with merchandise.

German Mineral Oil

Customs Bureau announced Jan. 17 that the appraiser at the port of New York has issued a notice of suspected dumping in the case of mineral oil imported from Germany.

Egg Products

A bill (H. R. 6531) proposing an embargo on importation of eggs fresh or dried or otherwise preserved, and of egg yolks and albumen, has been introduced by Rep. Theodore Christianson (Minn.). Present tariff rates on these products are: Eggs in the shell, 10c per doz.; frozen or otherwise prepared or preserved and not specially provided for, 11c; per lb. dried eggs, dried egg yolk, and dried egg albumen, 18c per lb.

Foreign Rulings

U. K. Treasury order, effective from Jan. 20 to Dec. 31, '34, reduces from 33 1/3% to 10% advalorem the duty on amido-ethyl alcohol imported from sources outside the British Empire. Duty on palm oil casks of certain dimensions, imported empty, was reduced from 20 to 10% ad valorem.

*President Roosevelt signed the Chemical Alliance Code Feb. 10.

Summary of foreign tariffs and trade regulations news includes the following: Australia exempts Cyanogas (Cyanamid's calcium cyanide, useful for killing Australia's worst pest—rabbits) from sales tax; Switzerland has established import quota restrictions on caustic soda, solid and calcined soda; a lower import duty for cetyl alcohol has been asked for in Great Britain; Uruguay has postponed adoption of a revised customs valuation on naval stores; Uruguay has suspended increase of import duty on powdered sulfur. Chemicals, Ltd., (Canada) is asking for a 20% intermediate and a 25% general tariff on nicotine sulfate. It now enters free in all classifications.

Brunner, Mond Canada, Ltd., single Canadian soda ash producer, with plant located in Amherstburg, Ont., has petitioned Canadian Tariff Board for free entry of coke required for the manufacture of ash. From Chile it is reported that the rumor that all trade-marks for chemicals, pharmaceuticals, medicinals, perfumery, etc., must be registered is incorrect. Proposal has been made but is not law. Naval stores duty valuation schedule used by customs office of Montevideo has been revised by presidential decree. Bromine and bromides are among the articles on which the Italian import duties were increased, effective Jan. 22.

Association News

Postmaster General James A. Farley will be the principal speaker at the ninth annual dinner of the drug and chemical section of the N. Y. Board of Trade, at the Waldorf March 8. He will be introduced by Bristol-Myers' Lee Bristol as Toastmaster. Reception committee chairman Huisking reports over 600 reservations now on hand and attendance at the premiere national social event of the drug and chemical field is expected to run over 1,000. Reservations may be made with section secretary Schlotterer, 41 Park Row.

Keyes in New York

Illinois' Donald B. Keyes will speak on "Cooperative Studies on Sulfur Dioxide Removal From Flue Gases" before the American Section of the Society of Chemical Industry on Feb. 17 at the Chemists' Club (N. Y.). Prof. Keyes is a former U. S. I. director of research, and since '26 has specialized on catalytic oxidation, fractional distillation, and chemical studies involved in power production.

Employment

Factory employment in the manufacture of chemicals and related products showed a further slight decline between Nov. 15 and Dec. 15, decrease being 0.8%. Volume was, however, 28.7% above that in the corresponding month in '32. Payroll totals in factories in the chemical group of industries increased 0.4% during the period and stood 29.3% above the '32 level. A. F. of L.'s statistics place unemployed at 10,826,000 in December. Of these approximately 4,000,000 are estimated on government emergency work.*

*See page 175 for detailed employment and payroll figures.

Litigation

Phthalic anhydride patent dispute between the Americans, Harry D. Gibbs and Courtney Conover against the German, Alfred Wohl, ended Jan. 2 when the U. S. Court of Customs and Patent Appeals decided in favor of the latter.

Patent involves vapor phase process for oxidation of napthalene with a vanadium pentoxide catalyst to produce phthalic anhydride, phthalic acid, benzoic acid, and naphthaquinone.

Litigation is of special interest as it shows that under the stress of war necessity both the American and German chemists were feverishly working on the problem at about the same time.

Gibbs-Conover patent was a basic government right, inventors having been chemists in the Dept. of Agriculture when the process was discovered. U. S. Patent Office cancelled the Gibbs-Conover patent in October, '31, and the department filed its appeal in the following February.

When the American patent was contested, Gibbs and Conover claimed that they conceived the invention in August but they could not prove that they had tested it out or reduced it to practice prior to Sept. 7, '16. They contended that Wohl could not have made the invention in June as the German patent office had held, because his original application did not disclose it. In awarding patent to Wohl, Appeals Court stated that the June date would not be accepted but that Wohl filed with the German patent office, Sept. 4, a document which in the U. S. patent office would be considered a new application and that this date marked Wohl's reduction to practice, and was 3 days earlier than the date claimed by the American inventors.

Company News

"For pioneering in industrial research," G. E. was presented, Feb. 1, with a gold medal by the American Institute of the City of N. Y. Institute, which was founded more than 100 years ago, includes among its objectives the recognition of achievements in science which have profoundly influenced human affairs. Council of Awards decided that the establishment and maintenance by G. E. of its large laboratory for pure research has been of lasting benefit to human progress and industry. Laboratory, which was created in 1900, when Dr. Willis R. Whitney (1st of the famous G. E. triumverate which included Langmuir and Coolidge) went to Schenectady from M. I. T. to assume the position of research director for the company, has been the scene of scientific discoveries which have greatly expanded existing industries and have created in several notable instances large new industries.

Guests of honor included following group of America's outstanding "scientific trust", Dr. Irving Langmuir, G. M.'s, Dr. Charles F. Kettering; A. C. S. president, Dr. Charles L. Reese, Dr. Frank B. Jewett; Dow's Dr. William J. Hale; Dr. Arthur D. Little, Eastman Kodak's Dr. Charles E. K. Mees, Dr. Leo H. Baekeland. Mellon Director, Dr. Edward R. Weidlein, and McGraw-Hill's chief editorial director and former *Chem. Met* editor, Dr. Howard C. Parmelee, were members of the Council on Awards.†

Hauser Joins Heveatex

Heveatex Corp., Melrose Mass., has opened an office at 90 Broad st., N. Y. City, for the sale of rubber latex and concentrated latex and for technical servicing

Outstanding rubber latex authority—Dr. W. J. R. Hauser

of these products. Office will be in charge of W. J. R. Hauser, who has joined the corporation as vice-president in charge of sales. Mr. Hauser is well known in connection with his work of some years in the U. S. and abroad in the development of the uses of latex and concentrated latex. Mr. Hauser's extended experience will be available to users and experimentors for applications of latex in the chemical fields.

Bacharach Organizes

Empire Distilling, which has acquired a large distillery in southwest Philadelphia, is now in production. Company has established executive offices at 347 Madison ave., N. Y. City. It is producing a full line of industrial alcohols. While products

†Langmuir received the '32 Nobel chemistry prize; Whitney retired as director in '31, retaining title of vice-president in charge of research, and Coolidge now directs the "House of Magic."

at this time will include completely and specially denatured industrial alcohols as well as taxfree pure neutral spirits, it will soon enter the potable beverage field with certain proprietary products.

One of the best known figures in industrial alcohol circles—Lester S. Bacharach

President of the new company is Lester S. Bacharach, outstanding executive in the industrial alcohol field. Technical adviser, Dr. Adolph Placek, is a graduate of the University of Prague, and has served with some of the largest industrial chemical and alcohol companies in this country. Distillery superintendent, Benedict Kempff, is one of the skilled veterans in the distilling field. Joseph E. Schwarz, formerly of Jefferson Distilling & Denaturing, with which Mr. Bacharach was also long identified, and a former vice-president of General Industrial Alcohol, has recently arrived from New Orleans to join the organization. W. Kirk Sullivan, treasurer, is a well-known business man of Chicago and New York, and well versed in financial affairs. Fred L. Mills, vice-president, is a Chicago capitalist and sportsman.

Carbide Appoints

Carbide has appointed ethyl alcohol distributors for New England and northern Ohio territory. Smead & Small, Inc., Cleveland, represents Carbide in northern Ohio, and Rogers & McClellan, Boston, will distribute in New England.

Heard Here and There

American Aniline Products, N. Y. City, is celebrating its 25th anniversary. Bernard R. Armour, president, was tendered a dinner Jan. 11 at the Waldorf by 75 business associates. The W. W. Sly Mfg. Co., Cleveland manufacturer of positive dust collection apparatus, is celebrating its 60th anniversary. Sterling Borax has moved offices to 526 W. 18 st., Chicago. Refinery is at New Brighton, Pa. Archer-Daniels-Midland has purchased American rights to a new improved continuous solvent process in Germany and is remodeling the Chicago plant preparatory to offering "New Process Soybean Oil Meal." Rolls Chemical, Buffalo, has been appointed territorial sales representative for Bisbee Linseed Co., Philadelphia. American Potash & Chemical has appointed O. Homel Co., Inc., 209 Fourth ave., Pittsburgh, as agents for the sale of "Three Elephant" borax and boric acid in Western Pennsylvania, West Virginia and Ohio.

Michigan Alkali's new "Malium" will kill insects and their eggs, but is harmless to humans in ordinary concentrations.

Signs of Better Times

Barclay Chemical has moved to larger quarters at 75 Varick st., N. Y. City. American Catalin is moving Feb. 24 to larger quarters at 1 Park ave., N. Y. City. U. S. I.'s Cleveland office is now at Distribution Warehouse Terminal, 2,000 W. 14 st., with Carl H. Sauer in charge. Smith Chemical & Color, manufacturer, exporter and importer of dry colors and mineral fillers, has moved main office and warehouse from 28 Moore st., N. Y. City, to 55 John st., foot of Jay st., Brooklyn. Chas. L. Huisking & Co. Inc. and Conti Products Corp. have leased jointly the building adjoining the one now occupied by them, and after alterations now being made are completed these 2 companies will occupy the entire premises of 149 to 155 Varick st., N. Y. City.

Heavy Chemicals

Up The Avenue*

American Cyanamid has executed lease with Rockefeller Center, covering about 120,000 sq. ft. on the 57-58-59-60 and a part of the 61st floor in the new R.C.A. building at 30 Rockefeller Plaza, N. Y. City.

Cyanamid's executives and employees will look down on 4 sides of N. Y. City from the 57-61st floors of RCA building, last word in modern skyscrapers.

Lease is for 20 years commencing March 1, 1934. It is expected that new space will be occupied April 1.

Move was necessitated by the need for more space by Cyanamid to take care of its growing business and to provide for future expansion. As the company occupies at its present address about 25 floors, each having much less space, new location being all on 5 adjoining floors, will lend itself to the much more efficient conduct of the company's business.

Subsidiaries which will have offices at 30 Rockefeller Plaza are:—

American Cyanamid & Chemical Corp., American Cyanamid Sales Co., Amalgamated Phosphate Co., American Powder Co., Arizona Chemical Co., Beetleware, Corp., Calco Chemical Co., Chemical Construction Corp., Chemical Engineering Corp., Fumigators Supply Co., General Explosive Corp., A. Klipstein & Co., Maryland Chemical Co., Owl Fumigating Corp., Rezyl Corp., The Selden Co., Structural Gypsum Corp., Synthetic Plastics Co.

*Cyanamid has been located successively at 511, 535 5 ave., and latest move is to 50th st. and 5 ave.

Important Price Changes

	Jan. 31	Dec. 31
ADVANCED		
Antimony, metal	$0.07¼	$0.07
Arsenic, metal	.44	.42
Blackstrap molasses	.08½	.07½
Bordeaux Mixture	.10½	.08½
Calcium arsenate	.06¾	.06¼
Dichlorethylether	.21	.16
Ethylene dichloride	.05½	.05
Glycerine, dynamite	.10¾	.10
soaplye	.06¾	.06¼
Lead arsenate	.10	.09½
Potash chrome alum	.07	.06¼
Potash permanganate	.18½	.17½
DECLINED		
Sodium stannate	.34	.35
Tin crystals	.38	.38½
Oxide	.55	.57
Tetrachloride	.25½	.26

Satisfactory Tonnage

January volume gradually increased until the total in the last 2 weeks proved to be very satisfactory and rather surprising in view of the fat that most consumers with low priced contracts closed the year with large inventories. Most encouraging were the spot inquiries and sales. Stragglers in getting in under wire on contracts for this year finally came into the fold and most industrial chemical producers reported contract consumers 100% signed up. Practically all chemical consuming lines were reported as progressively in-

creasing their activity and the outlook for February was very encouraging.

Price changes were fewer. Most important were the new prices announced for the leading insecticides and fungicides. The '34 schedule for Bordeaux Mixture is as follows:—Jobbers, c.l., 8c to 16c per lb., according to quantity and packing; l.c.l., 8½c to 16½c per lb., according to quantity and packing. For the Western territory the prices follow:—Jobbers, 8c to 10c per lb.; l.c.l., 8½c to 10½c per lb., according to quantity and packing. Dealers, c.l., 9c to 11c per lb.; l.c.l., 9½c to 11½c per lb.

The calcium arsenate schedule is: For the North and Western territories:—Jobbers c.l., 6¾c to 14¾c per lb.; l.c.l. 7¼c to 15¼c per lb., according to quantity and packing. Southern, or cotton belt district, jobbers, c.l., 7c to 15c per lb., less 5%; dealers, c.l., 7c to 15c per lb.; l.c.l. 8c to 16c per lb., according to quantity and packing.

Lead arsenate schedules has been revised as follows: Jobbers in Eastern territory:—c.l., 10c to 18c per lb.; l.c.l., 10½c to 18½c per lb., according to quantity and packing. Dealers prices are 10½c to 19½c per lb for c.l. quantities and 11½c to 20½c per lb. for l.c.l. Western division, jobbers, c.l., 10c to 18c per lb.; l.c.l., 10½c to 18½c per lb., according to quantity and packing. Dealers prices are 10½c to 19½c per lb. for c.l. amounts and 11½c to 20½c per lb. for l.c.l.

Important changes have also been made in lime sulfur also. Jobbers' prices for '34:—Tanks, 8c per gal.; c.l., drums, 14c to 33c, per gal., and l.c.l., 14½c to 35c per gal. Dealers' prices find the tanks at 8c per gal.; c.l., drums, at 15c to 38c per gal., and l.c.l., drums, at 15c to 40c per gallon.

Contracts for nicotine sulfate were offered at unchanged figures, and paradichlorbenzene producers offered, under contract, to take business at 16-20c for l.c.l. drum lots and 18-25c for kegs.

Other important price revisions are listed, and generally speaking, represent delayed readjustment to present monetary conditions, plus a better demand.

Foreign Heavy Chemicals

Italian copper sulfate production amounted to 81,214 metric tons in 1st 9 months of '33, compared with 74,996 tons in corresponding period in '32. Imports were 2,231 tons, against 7,445 tons; exports were 5,694 tons, against 1,318 tons. Australian sulfur imports from U. S. in 12 months ended June 30, '33, totalled 1,118,388 hundredweight, which compared with 610,940 hundredweight in preceding fiscal year. Total imports during '32-'33 period amounted to 1,868,907 hundredweight as against 658,346 hundredweight in the '31-'32 fiscal year. Argentine sulfur imports in the 1st 9 months of '33 amounted to 11,618 metric tons, compared with 13,001 tons in the corresponding period in '32.

U. S. Sulfur in Foreign Markets

Fall of the dollar has brought about a progressive decline in the value of American rock sulfur imported into Europe and has added further to the difficulties attending the marketing of Italian sulfur. Italian producers, since the ending 18 months ago of the Italo-American agreement and the dissolution of the Sicilian consortium have had a number of serious problems to contend with. The Italian Government has stepped into the breach with the formation of the Central Sulphur Sales Bureau to market the entire output of both Sicilian producers and the Montecatini. In practice the government will subsidize the industry so as to bridge present production costs and world prices. Despite adverse conditions, it is reported that Sicilian production during '32-'33 was larger than that of several years previous, and is estimated at 290,000 tons. Present stocks are heavy-estimated between 100,000 and 200,000 tons.

Chloride Association Moves

Calcium Chloride Association, (Columbia Alkali, Dow, Michigan Alkali and Solvay) now in larger quarters at 2075 Penobscot Bldg., Detroit, has added B. C. Tiney as chief engineer. He will devote his time to low-cost roads "through stabilization and incorporation of calcium chloride as a binder in the road surface." Fred Burggraf is soils engineer.

Fine Chemicals

Greater Price Stabilization

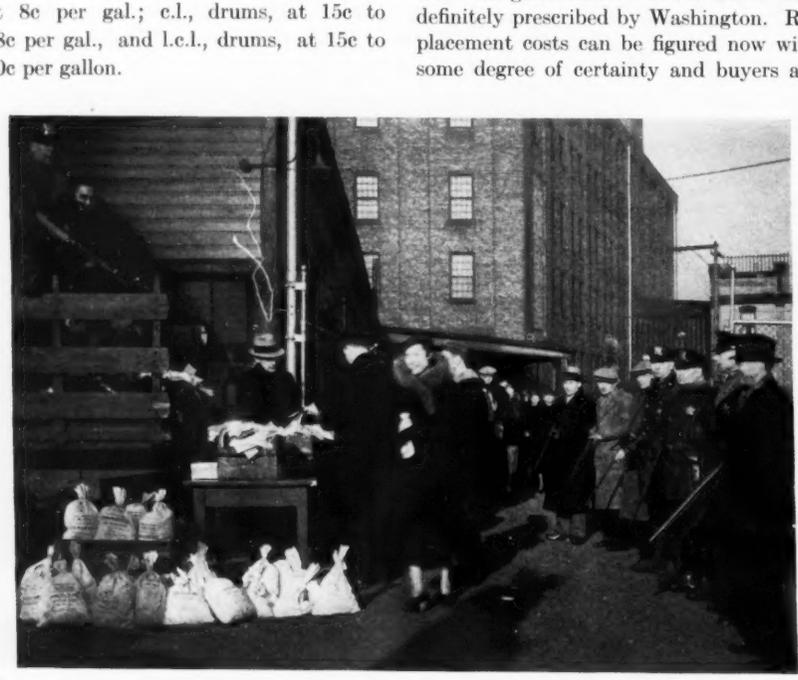
Fine chemical prices are expected to show much greater degree of stabilization with the gold content of the dollar now definitely prescribed by Washington. Replacement costs can be figured now with some degree of certainty and buyers are now more willing to enter into contracts.

Important Price Changes

	Jan. 31	Dec. 31
ADVANCED		
Acid, citric, U. S. P.	$0.28	$0.29
Gallic, U. S. P.	.77	.74
Alcohol, ethyl	Tax raised to $2.00	
Glycerine, C. P.	.11½	.11
Mercury	68.50	66.50
Potassium permanganate	.18½	.17½
Silver nitrate	.32⅜	.31⅜
DECLINED		
Acetaldehyde, 99%	$0.16	$0.18½
Aldol, 95%	.21	.27
Crotenaldehyde, 98%	.26	.32
Iron ammonium citrate, all grades 2c a lb.		
Paraldehyde, 90-99%	.16	.20½
Potassium iodide	2.00	2.15

Price changes were not quite so numerous. Despite determined opposition the additional tax of $0.90 a gal. has been added to industrial ethyl alcohol as the best means of hindering the bootlegger's nefarious practices. It is not expected, however, that legitimate industrial users will cease efforts to obtain relief. Blackstrap was advanced 1c. Sale of denatured for anti-freeze purposes has been satisfactory to date and less carry-over is anticipated than for several years past.

Iron and ammonia citrate prices were reduced under competition. New quotations:—Brown scales, 52c; granular and pearls, 42c; green scales, 52c; granular and powder, 42c.



If Bryan could have but seen it! Burgess Industries, Freeport, Ill. recently paid off 500 employees in 30,000 pieces of silver. Cartwheels flowed into the merchants' tills.

The rise in glycerine has been forecasted for several months by the exceptionally firm price position. Anti-freeze business has been good, according to reports in the trade. As the month closed a 1c reduction in citric was announced by domestic producers. Imports in the past few months have been sufficient to bring about noticeable competition. Other price changes listed were largely the result of currency fluctuation and price changes on the metals, notably stronger prices for silver.

Coal Tar Chemicals

December Imports

U. S. December imports of synthetic dyestuffs amounted to 285,079 lbs., ($394,626). Month's imports were 29% less in volume than those in preceding month, and 22% less in value. They exceeded those in Dec., '32, by 2% in volume, and 37% in value.

Imports of synthetic dyes during '33 amounted to 4,288,214 lbs., ($4,791,704). Comparison with imports of 3,904,628 lbs., valued at $3,516,968, in '32, shows an increase of 10% in volume and 37% in total value. Unit invoice value of imported dyes increased from an average of $0.901 per lb. in '32 to an average of $1.117 in '33, December price being $1.384 per lb.

Imports of intermediates, medicinals, and other fine coal tar chemicals rose in December, and were 33% larger than those in November. They were 21% less in volume than those in December, '32, but had a 50% greater value. Imports during the year were 27% larger in volume than those in '32, and 68% more in value. Imports of coal tar color lakes slumped in December. Year's total was 11,584 lbs., 19% below that for '32.

Imports of Synthetic Dyes

	1933		1932	
	Pounds	*Value*	*Pounds*	*Value*
Jan..	314,878	$311,640	297,266	$259,558
Feb..	365,144	369,829	429,298	367,154
Mar.	267,890	257,626	482,545	410,865
Apr..	232,741	229,078	300,144	259,425
May.	360,490	352,111	206,225	203,483
June.	382,452	389,174	117,792	109,208
July.	513,436	567,790	151,089	138,136
Aug..	597,394	682,893	369,327	329,810
Sept.	315,214	401,296	414,161	365,326
Oct..	254,270	326,199	426,057	391,803
Nov.	399,227	509,442	431,759	394,949
Dec..	285,078	394,626	278,985	287,251
Total	4,288,214	$4,791,704	3,904,628	$3,516,968

Countries of Origin of Dye Imports

	Percentages December	
	1933	*1932*
Germany	65.55	61.33
Switzerland	32.86	38.13
England	1.07	.30
All other	.52	.24

Few Price Changes

Aside from price readjustments in benzol and technical resorcinol the coal tar market experienced few price revisions. Demand grew as the month passed for all divisions of the group Dyes were in much better demand and this was reflected in heavier intermediate tonnages. Resorcinol is now quoted at 65c for contracts and 75c for spot purchases. Benzol producers early in the month named 20½c for tanks and 25½c for drum shipments for the first quarter of '34. Producers at first started soliciting contracts at 22c and this figure remains as the maximum on contracts. Price of 20½c is slightly higher, however, than the figure at which '33 business was closed.

Important Price Changes

ADVANCED

None

DECLINED

	Jan. 31	Dec. 31
Benzol, contracts, tanks	.20½	.22

Upholds NRA

Supreme Court Justice McGeehan upheld constitutionality of NRA and N. Y. State Schackno Act, embodying provisions of NRA, in suit brought by Cleaners and Dyers Board of Trade, Inc., against Spotless Cleaners and Dyers, Inc., to restrain latter from violating provisions of the Act.

Important Statistics of the Coal Tar Industry*

	December 1933	*December 1932*	*November 1933*	*November 1932*	*Total 1933*	*Total 1932*
Coking coal—by-prod., ovens tons	3,553,988	2,581,900	3,390,804	2,532,100	38,682,900	30,887,181
Benzol production, gal	5,421,000	4,037,000	5,236,000	3,959,000	61,858,000	48,065,000
Light oil production, gal	10,448,724	9,968,963	9,969,063	7,748,226	113,727,726	94,514,773
Tar output, gal	34,971,241	33,365,511	33,369,511	23,295,320	380,640,736	284,162,065
Ammonium sulfate prod., tons*.	40,977	30,250	39,096	29,714	446,013	362,461

*There were 91 by-product plants in existence at the end of '33, with a capacity of 171,671 tons per day, of which 85 made coke during the year; 66 plants were producing ammonia beginning Dec., '33; 55 were making benzol or motor benzol at the beginning of Dec. and 61 were recovering crude light oil at the start of the final month. Figures are arranged from Bureau of Mines statistics.

Paints, Lacquers and Varnish

Recovery Board Praised

Paint Industry Recovery Board met in Chicago on Jan. 5 and listened to words of congratulation from NRA Major Charles R. Baxter, administration member of the Paint Recovery Board, on the way the industry had drawn up and was also administering its code.

An executive committee was elected to act for the Board in matters where it is not feasible or expedient to bring the entire group together.

New committee is composed of H. A. Melum, Benjamin Moore, Chicago; J. D. Patton, Pittsburgh Plate Glass, Milwaukee; E. S. Phillips, Devoe & Raynolds, N. Y. City; Wm. Richter, DuPont, Wilmington; F. L. Sulzberger, Enterprise Paint, Chicago; E. T. Trigg; J. V. Reardon, The Reardon Co., St. Louis; Rudolph Neuberger, Zapon Co., Stamford, Conn.; and A. E. Horn of A. C. Horn Co., Long Island City.

E. S. Philips was elected chairman of the executive committee and Frank L. Sulzberger vice-chairman. President Trigg read a report on the association's activities since the Chicago convention, and several reports were read and accepted. Resignation of Thomas J. McFadden as general manager of the association was accepted with regret. George B. Heckel, well-known figure in the paint and varnish industry for years, was elected secretary-emeritus of the association in appreciation of his untiring efforts in the past.

Important Price Changes

ADVANCED

	Jan. 31	Dec. 31
Asphaltum, Mex., Texas	$22.00	$18.00
Green, chrome oxide, imp.	.22	.20
Orange mineral, French tours	.17⅜	.14⅜
Red Carmine	4.40	3.65
Zinc oxide, imp. ex stock	.11	.10¼
ex-warehouse	.11¼	.10¼

DECLINED

Casein, dom., 20-30 mesh	.12	.12½
Titanium pigments, 5 ton lots, ex-warehouse	Orders taken at 20 ton lot price	

Raw Materials Slow

Paint producers stepped up production schedules appreciably, but purchasing of raw materials was done in moderate volume, reflecting large inventories carried over into the new year. This condition, however, is expected to change shortly. Construction figures continue to reflect further improvement, although, unquestionably, public works represents by far the larger part. Nevertheless, private construction is beginning to show signs of definite revival and the outlook for spring business is very encouraging for paint manufacturer and supplier of raw materials alike.

Elton Chosen by N. P.V. & L. A.

National Paint, Varnish and Lacquer Association has named Reuel W. Elton secretary. Mr. Elton is no stranger to the paint field. He was secretary of the American Paint and Varnish Manufacturers' Association, and at the same time assistant general manager of the N. P. O. & V. A. These 2 associations were

amalgamated at the last paint convention into the single national organization now functioning. Mr. Elton resigned from the paint associations in '32 to become associated with the Better Business Bureau of Pittsburgh. He is well-known in veterans' circles, having served in executive capacities in several organizations, he was a captain in France, and is a chevalier of the French Legion of Honor. For a number of years he served in the organization division of the Pittsburgh Chamber of Commerce.

Paint Personals

Hercules' J. M. Schentz and Robert A. Coolahan spoke recently before the N. Y. Paint & Varnish Production Club. S.-W.'s Dr. C. D. Holley spoke before the Toronto Paint & Varnish Production Club on Feb. 9 on "Paint Problems." Dr. A. O. Plambeck of the same company addressed the Ottawa Section of the Society of Chemical Industry on Feb. 8 on "Paint, Varnish and Lacquer Technology." N. P. V. & V. Association head, Ernest T. Trigg, has urged that all CWA paint purchasing be done on a uniform plan, in which local factors would be the source of supply at a legitimate profit. Gregory S. Mangin, son of J. J. Mangin, United Color & Pigment's president, and 1 of the country's leading tennis players, is engaged to Miss Mary J.Kenny, daughter of Mr. and Mrs. William F. Kenny, N. Y. City.

Frederick Hertenstein, president of Charles Moser Paint, Cincinnati, and a vice-president of the Eagle-Picher Lead, recently completed the 25th year of his presidency of the Western Bank & Trust. Benjamin Joachim, director of Joachim Research Laboratories, Brooklyn, delivered an address on specifications for paints, varnishes and waterproofings before a group of architects and engineers Jan. 15. The series of bi-weekly lectures on paint and varnish manufacture given by Mr. Joachim at his laboratories, are being attended by trade interests in increasing numbers.

Personnel Changes

National Lead's new Chicago special representative in charge of industrial sales is Winfield Scott Carlisle. McCloskey Varnish, Philadelphia, has re-elected William H. Jarden, Jr., president, C. Fred Rau, secretary-treasurer, and elected as vice-presidents, H. B. Almond and Joseph O. Olsen. Mr. Almond will direct sales with V. C. Bidlack as assistant sales manager. John Lucas, Philadelphia, has elected Harry J. Goodyear as secretary-treasurer. William O. Jennings has been named sales manager of Chi-Namel, Cleveland.

Industry Deaths

Thomas F. West, 67, superintendent, Felton, Sibley's Camden plant, died Jan. 15. Charles H. Stephenson, Sr., 64, president, Stephenson Brokerage, Louisville, which among other lines had the Bisbee linseed oil account, died Jan. 7. Thomas E. Clarke, 65, retired Alston-Lucas Paint treasurer, died Jan. 10. Known familiarly by his friends as "Ned" he was one of the most popular men in Chicago paint circles. He was in Alston-Lucas employ for 40 years, retiring a year ago.

George E. Weaver, 85, founder of Weaver & Co., Providence, died Jan. 5. Frank E. Nelson, 50, Schaefer Varnish salesman for the past 20 years, died Jan. 9. George W. Jagle, 66, former president, J. J. Hockenjos & Co., Newark paint manufacturer, died Jan. 29.

Babcock on Tour

Stephen C. Babcock, synthetic and ester gum expert, recently made manager of sales on oil soluble resins for General Plastics, is now on a tour of the consuming trade in the middle west. Mr. Babcock enjoys a wide acquaintance in the varnish industry, where he has spent his entire business career.

Dots and Dashes

Du Pont's Edward F. Maloney, Chicago, is chairman of the '34 paint show of the Federation of Paint and Varnish Production Clubs.

Lacquer industry is speculating as to what brewer American Can has interested in lacquered beer containers.

Devoe & Raynolds net income (year ending Nov. 30) equaled $3.78 on A & B shares comparing with a net income of only $21,765, or $1.62 on 13,414 shares of 7% 1st preferred in the previous fiscal year. Anderson-Prichard (petroleum solvents, naphtha, etc.) reports through C. H. Dresser, director of industrial naphtha sales, that rumor that company was about to enter paint business is unfounded. Sewall Paint & Varnish's lacquer salesmen convened in Kansas City on Jan. 8-10 under direction of Vice-president A. G. Bale and G. E. Weissert, lacquer dept. manager. Glidden's November and December sales (1st 2 months of the fiscal year) amounted to $3,954,705, compared with $2,916,931, an increase of $1,037,774, or 35.5%.

Washington has been chosen as the city for the fall convention of the National Paint, Varnish and Lacquer Association but no definite date has been set as yet.

Outlook for Linseed

How large a flax acreage, asks Archer-Daniels-Midland in its weekly market letter, will the U. S. plant in 1934? It has taken a long time for the authorities to realize that while our country grows a surplus of wheat, corn, etc., it has raised less than one-half of the flax needed in the past few years. Some agitation is now beginning for an increased flax acreage. Last year 1,750,000 acres were sown. This was probably 1,000,000 acres less than the 10 year average. A 50% increase over '33 is being recommended for '34. But how is this going to be accomplished? First, there is a shortage of flaxseed in this country for seeding purposes; second, there are 12,000,000 acres in the Northwest infested by grasshoppers for the eradication of which there are not adequate funds. The flaxseed plant is particularly pleasing to the grasshoppers. Third, legislation to promote seed loans has not been adopted at Washington; fourth, land taken out of wheat growing under the processing arrangement cannot be sown to any other crop which is marketed directly or indirectly. Therefore, flax must find its way to new land. Personally, we are not optimistic about the size of this year's flax crop because of the above mentioned obstacles.

Bureau of Census announces there were 24 mills in the U. S. which crushed flax-

November Paint, Varnish and Lacquer Sales

Sales of paint, varnish and lacquer products in November totaled $16,234,234 in value, according to monthly report of U. S. Bureau of Census from data supplied by 586 establishments. This compared with $18,944,106 in preceding month and $12,494,818 in November, 1932. January-November sales in '33 were $206,604,923, and sales for the corresponding period of '32 were $193,838,795.

		Classified sales reported by 344 establishments				
			Industrial sales		*Trade sales of*	
1933	*Total sales reported by 586 establishments*	*Total*	*Paint and varnish*	*Lacquer*	*paint, varnish and varnish*	*Unclassified sales reported by 242 establishments*
1933—Jan.....	$11,275,396	$3,529,886	$2,386,947	$1,142,939	$4,168,260	$3,577,250
Feb.....	11,665,734	3,423,033	2,445,378	977,655	4,771,706	3,470,995
March...	13,578,568	3,391,947	2,484,550	907,397	5,788,213	4,398,408
April....	19,043,787	4,677,309	3,143,803	1,533,506	8,582,411	5,784,067
May.....	26,241,044	5,991,938	4,298,455	1,693,483	11,788,573	8,460,533
June.....	27,813,233	6,827,509	4,832,551	1,994,958	12,443,998	8,541,726
July.....	22,090,187	6,406,184	4,493,516	1,912,668	8,627,400	7,066,603
August..	20,620,811	6,323,475	4,754,701	1,568,774	7,840,359	6,456,977
Sept.....	19,097,803	5,544,686	3,975,917	1,568,769	7,462,113	6,091,004
Oct.....	18,944,106	4,949,755	3,721,420	1,228,335	7,376,012	6,618,339
1932—Jan.....	15,894,506					
Feb.....	16,270,822					
March...	19,089,005		Comparable data not available			
April....	22,612,193					
May.....	24,981,441					
June.....	19,637,358	4,685,399	3,617,719	1,067,680	8,734,330	6,217,629
July.....	14,430,122	3,793,245	2,900,707	892,538	6,058,813	4,578,064
Aug.....	16,032,441	3,851,028	3,057,096	793,932	6,918,659	5,262,754
Sept.....	16,805,712	3,980,564	3,113,303	867,261	7,216,748	5,608,400
Oct.....	15,592,377	3,996,500	3,036,323	960,177	6,610,011	4,985,866
Nov.....	12,492,818	3,599,319	2,639,362	959,957	5,196,766	3,696,733
Dec.....	9,484,520	3,222,770	2,186,706	1,036,064	3,506,715	2,755,035
Totals	$203,323,315	.....	.....	.....	.....	.....
1931—Totals..	278,442,170	.....	.....	.....	.....	.....

seed during the quarter ending Dec. 31, '33, reporting a crush of 189,266 tons of flaxseed and a production of 133,905,936 lbs. of linseed oil. These figures compare with 139,934 tons of seed crushed and 90,987,258 lbs. of oil produced for the corresponding quarter in '32; 199,149 tons of seed and 130,478,580 lbs. of oil in '31; 206,944 tons of seed and 131,256,804 lbs. of oil in '30.

Stocks of flaxseed at the mills on Dec. '31, 33, amounted to 75,171 tons compared with 87,384 tons for the same date in '32, with 104,192 tons in '31, with 125,218 tons in '30, with 121,782 tons in '29, and with 214,578 tons in '28. Stocks of linseed oil reported by the crushers were 119,656,272 lbs. on Dec. 31, '33, compared with 90,409,811 lbs. for the same date in '32, with 123,626,578 lbs. in '31, with 83,035,584 lbs. in '30.

In sympathy with other rising markets flaxseed prices showed tangible net gains for the month. Inquiry for linseed was in good volume. Outlook for spring is viewed in most quarters as being very favorable.

A new complication arose last month in the shape of a restriction quota on importation of American linseed cake into Belgium. France and Holland had previously made similar restrictions. England has a 10% duty against our cake. Result of this will be that American crushers will probably have to take less for their by-products. It may even happen that the production of linseed will have to be curtailed because of an absence of outlets for linseed cake and meal.

Gums, Waxes, Shellac

Shellac Cornered?

Shellac prices skyrocketed upwards in sensational manner in Calcutta and London and forced sharp revisions in domestic quotations here. Market buzzed with excitement over the operations of the London pool syndicate and concensus of opinion was that before its holdings were liquidated that much higher prices were quite certain.

Trading in both gums and waxes was extremely moderate throughout most of the month. Slightly easier price tendencies were noted in most of the waxes. The greater monetary stabilization accompanying the fixing of the gold content of the dollar is expected to hold most of the gum quotations from fluctuating as widely as they have for several months and which has kept the market in a very uncertain state. Replacement costs can be figured with greater certainty.

Chemical Trade Journal (British) commenting editorially on the sharp rise in shellac prices in primary market states: Although heavy buying which has occasioned price recovery may have been to some extent speculative, opinion in trade circles is that it rests to a greater extent upon a more substantial basis. Shellac finds its main uses in the varnish, gramophone record, and stiff-hat industries, all of which are at present experiencing a distinct revival in activity. Stocks of shellac in this country, and also in the U. S., are known to have been kept at comparatively low figures during the past year or 2, and the sudden revival in demand during the past few months has consequently meant a call to Calcutta for additional supplies, with the result that stocks in the East have been considerably depleted. In the U. S., the Roosevelt program of national reconstruction has led to the acceptance as very highly probable of a spurt in building operations, and consequently in painting operations.

Important Gum Price Changes

ADVANCED

	Jan. 31	Dec. 31
Aloe, Curacao	$0.13	$0.11
Arabic, white sorts,		
No. 1	.17	.16
No. 2	.16	.14
Camphor, slabs	.55	.59
powdered	.55	.59
Guaiac resin	.20	.18
Myrrh, U. P. S.	.25	.23

DECLINED

None

Important Wax Price Changes

ADVANCED

	Jan. 31	Dec. 31
Candelilla	$0.11½	$0.11

DECLINED

Beeswax, Brazilian	$0.22	$0.20
Chilean	.22	.20
San Dominigan	.16	.16½
Japan	.06	.06¾

Domestic Flaxseed Receipts By Weeks

Week Ending	Jan. 5 1934	Jan. 5 1933	Jan. 13 1934	Jan. 13 1933	Jan. 20 1934	Jan. 20 1933	Jan. 27 1934	Jan. 27 1933
Minneapolis cars	7	59	23	92	29	59	45	61
Duluth cars	16	16	2	24	9	22	8	5
Winnipeg cars	1	4	5	3	3	6	1	8
Totals to date this crop*	3,014	6,517	3,044	6,636	3,085	6,723	3,139	6,797

*Aug. 1.

Flaxseed Prices in Primary Centers

	Minneapolis			Duluth			Winnipeg			Buenos Aires	
Week Ending	Cash	May	July	Cash	May	July	Cash	May	July	1933	1932
Close Dec. 30†	1.81½	1.79½	.....	1.80½	1.80½	.....	1.44½	1.44¼	.....	.99⅝*	.60⅞
Jan. 5	1.81	1.79	1.81	1.79½	1.79½	1.80	1.43½	1.45½	1.44	.97½	Holiday
Jan. 12	1.86	1.82	1.84	1.83	1.83	1.83	1.46¼	1.48¼	1.47	.97¾	.61½
Jan. 19	1.90¾	1.86¾	1.88¾	1.89	1.89	1.89	1.49½	1.51½	1.50	.98	.61⅞
Jan. 26	1.92	1.86	1.88	1.88½	1.88½	1.88½	1.50	1.52	1.50½	.98¾	.60
Close Jan. 31	1.88	1.90	.....	1.89½	1.90	.....	1.55⅝	1.54½	.97½	.59⅞	

†Last trading season of 1933; *Prices of Dec. 29, last trading session of 1933.

Minneapolis Linseed Oil and Meal Shipments

Week Ending	Oil in Pounds 1934	Oil in Pounds 1933	Meal in Pounds 1934	Meal in Pounds 1933
Jan. 5	398,880	1,418,606	2,428,328	1,460,575
Jan. 12	659,255	1,088,711	2,626,195	2,175,099
Jan. 19	367,948	671,798	2,202,655	2,162,055
Jan. 26	769,407	518,537	1,383,977	2,036,499
Feb. 2	307,294	1,292,390	2,828,161	1,660,361
Totals to date	12,822,400	23,369,309	42,852,865	51,775,528

Linseed Oil Prices, Minneapolis, London, San Francisco & Chicago

Week Ending	Minneapolis Carlots	Minneapolis Tanks	London Weekly High	London High-Low* Low	San Francisco Carlots	San Francisco Tanks	Chicago Carlots	Chicago Tanks	N. Y. City Carlots	N. Y. City Tanks
Close Dec. 29†	9.7c	9.1c	19s 3d	18s 10½d	10 c	9.4c	9.7c	9.1c	9.3c	8.7c
Jan. 5	9.5	8.9	18s 10½d	18s 3d	9.8	9.2	9.7	9.1	9.3	8.7
Jan. 12	9.5	8.9	18s 1½d	17s 6d	9.8	9.2	9.5	8.9	9.3	8.7
Jan. 19	9.5	8.9	18s 9d	17s 10½d	9.8	9.2	9.5	8.9	9.3	8.7
Jan. 26	9.5	8.9	18s 6d	18s 1½d	9.6	9.0	9.3	8.7	9.3	8.7
Close Jan. 31	9.5	8.9		18s	9.6	9.0	9.3	8.7	9.3	8.7

*per cwt.; †last trading day of the year.

Buenos Aires Flaxseed Shipments, Stocks

	Exports in Bushels*					Total		Since January 1*					Total		Visible Supply	
Week Ending	U. S.	U. K.	Cont.	Orders	Others	1934	Same Week '33	U. S.	U. K.	Cont.	Orders	Others	1934	1933	1934	1933
Jan. 5	154	....	650	988	..	1,792	1,327	..	....	....	....	....	....	....	2,756	5,512
Jan. 12	173	....	555	1,386	28	2,142	2,940	327	....	1,205	2,374	28	3,934	4,267	3,950	5,118
Jan. 19	555	....	488	772	..	1,795	1,165	862	....	1,693	3,146	28	5,729	5,432	3,543	5,512
Jan. 26	106	....	402	1,130	..	1,638	1,820	968	....	2,095	4,276	28	7,367	7,232	3,937	5,512
Feb. 2	276	....	776	752	12‡	1,816	1,544	1,244	....	2,871	5,028	40	9,183	8,776	4,331	5,118

*000 omitted; ‡to Japan.

Indian Flaxseed Shipments

	Exports in Bushels*				Same as Last Year*				Since April 1, 1933*			Since April 1, 1932*			Total*	Total*
Week Ending	U. K.	Cont.	Others	Total	U. K.	Cont.	Others	Total	U. K.	Cont.	Others	U. K.	Cont.	Others	1934	1933
Jan. 5	92	8	...	100	4	32	..	36	8,176	2,956	1,472	432	1,664	280	12,604	2,376
Jan. 12	208	28	180†	416	..	12	36	48	8,384	2,984	1,652	480	1,700	316	13,020	2,496
Jan. 19	44	12	...	56	84	36	..	120	8,428	2,996	1,652	564	1,736	316	13,076	2,616
Jan. 26	92	44	...	136	4	52	..	56	8,520	3,040	1,652	560	1,788	316	13,212	2,664
Feb. 2	172	28	204‡	404	4	24	..	28	8,692	3,068	1,856	564	1,812	316	13,616	2,692

*000 omitted; †includes 160,000 bu. to U. S.; ‡to U. S.

With the low shellac stocks in Calcutta, American producers have been compelled to place their inquiries on the London market, an additional important "bull" feature in the situation. It is also far from probable that the encouraging progress believed to have attended the efforts of the investigators under the Indian Lac Products Research Scheme to find new uses for shellac has been a further contributory factor in lending a more optimistic tone to the whole situation, for the whole of Dec., '33. Unlike a growing number of natural products, shellac has up to the present nothing much to fear from the competition of synthetic bodies, for the production of a material of equal industrial value to shellac is still among the unsolved and fundamental problems confronting the research chemist working in the field of synthetic resins.*

Wax Importers Elect

New York Wax Importers' Association re-elected on Jan. 16 following officers:—President, A. H. Hoffman, Strohmeyer & Arpe; vice-president, W. F. Leary, C. W. Jacob & Allison; secretary, Charles Christman, Smith & Nichols, and treasurer, R. Sievert, Frank B. Ross, Inc.

Bleached Shellac Code

American Bleached Shellac Manufacturers' Association's proposed code, submitted at a public hearing Jan. 18 before Deputy Administrator F. J. Patchell, was violently attacked by NRA legal, labor and consumer advisors. In addition, Edward F. Parks, Fall River, contended that proposed accounting system would compel many companies to revamp their entire systems, while Henry U. Milne, Mail Order Association of America, filed a brief opposing open price provisions as a "subterfuge to outright price fixing."

In defense of the charge of price fixing association representatives stated that because of the highly speculative angle, "Over half of the industry has become bankrupt during the past few years."

Gillespie Re-elected

U. S. Shellac Importers' Association has re-elected: President, Louis Gillespie, Gillespie-Rogers-Pyatt; vice-president, Phillip N. Rowe, Phillips & Rowe; secretary and treasurer, L. W. Baggage, William Zinsser & Co. Board of directors for '34 consists of James W. Byrnes, James W. Byrnes Sales Corp.; Ralph W. McClintock, MacLac-Kasebier-Chatfield; S. F. Lerdon, Alfred Kramer & Co.; Morris Rosen, Mantrose Corp.; William H. Zinsser, William Zinsser & Co.; and John R. Anderson, Argenti & Co.

Cottonseed Products

	On hand August 1	*Produced Aug. 1 to Dec. 31*	*Shipped out Aug. 1 to Dec. 31*	*On hand December 31*
Crude oil, pounds—				
1933-1934	*51,269,417	749,832,888	650,552,460	*168,849,941
1932-1933	29,523,581	796,376,046	714,951,243	143,902,011
Refined oil, pounds—				
1933-1934	†676,331,574	‡566,728,460	.....	†769,234,854
1932-1933	628,420,148	605,953,198	.....	730,495,676
Cake and meal, tons—				
1933-1934	160,874	1,095,766	944,544	312,096
1932-1933	114,656	1,163,972	911,339	367,289
Hulls, tons				
1933-1934	76,686	651,477	603,271	124,892
1932-1933	162,773	733,217	660,670	235,320
Linters, running bales—				
1933-1934	70,786	437,145	346,107	161,824
1932-1933	235,521	409,029	360,233	284,317
Hull fiber, 500-lb. bales—				
1933-1934	985	28,180	24,933	4,232
1932-1933	4,138	10,404	5,208	9,334
Grabbots, motes, etc., 500-lb. bales—				
1933-1934	3,216	19,412	14,407	8,221
1932-1933	15,250	14,427	12,084	17,593

*Includes 4,274,646 and 18,190,330 lbs. held by refining and manufacturing establishments and 14,320,860 and 18,705,280 lbs. in transit to refiners and consumers August 1, 1933, and December 31, 1933, respectively.

†Includes 5,498,953 and 5,150,737 lbs. held by refiners, brokers, agents, and warehousemen at places other than refineries and manufacturing establishments, and 12,642,917 and 8,303,576 lbs. in transit to manufacturers of lard substitute, oleomargarine, soap, etc., August 1, 1933, and December 31, 1933, respectively. ‡Produced from 615,585,845 lbs. of crude oil.

Exports for Four Months Ended November 30

		1933	*1932*
Oil, crude	pounds	5,765,559	9,277,923
Oil, refined	pounds	1,815,469	2,655,859
Cake and meal	tons of 2,000 pounds	37,830	59,784
Linters	running bales	48,802	52,164

Trend of the Cottonseed Oil Markets

(N. Y. Produce Exchange, cents per lb. tanks)

Bleachable Prime Summer Yellow (cents)

Futures	*Dec. 29†*	*Jan. 5**	*Jan. 12**	*Jan. 19**	*Jan. 26**	*Jan. 31**
Jan.	4.40—4.53	4.45—4.60	4.65—4.75	4.65	4.65	.....
Feb.	4.40—4.65	4.45—4.60	4.60—4.68	4.65—4.79	4.60—4.68	4.80—4.90
March	4.62—4.65	4.62—4.65	4.75—4.78	4.81—4.82	4.76—4.80	4.90—4.93
April	4.65—4.82	4.65—4.80	4.80—4.90	4.82—5.00	4.80—5.00	4.90—5.10
May	4.78—4.83	4.80—4.85	4.92—4.97	4.92—4.99	4.98	5.06—5.12
June	4.80—5.00	4.80—4.99	4.95—5.10	5.02—5.10	5.00—5.15	5.10—5.20
July	4.98—5.00	5.00—5.02	5.12—5.13	5.15—5.17	5.16	5.28—5.29
Aug.	.....	5.05—5.15	5.14—5.20	5.15—5.25	5.15—5.28	5.30—5.43
Sept.	.....	.....	.....	.....	.....	5.46—5.47
Total sales contracts for wk.		43	89 (16 Switches)	193 (62 Switches)	147 (80 Switches)	
Spot prime summer yellow	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal
Crude southeast	3.37½—3.50c	3.37½—3.50c	3.50c	3.62½—3.75c	3.62½c	3.62½c
Valley	3.37½—3.50c	3.37½—3.50c	3.50c	3.62½—3.75c	3.62½c	3.62½c
Texas	3.12½—3.25c	3.12½—3.25c	3.25-3.37½c	3.37½—3.75	3.37½c	3.62½c

*Closing price on Fridays of the month. †Last trading session of 1933.

Cottonseed Products Prices

	Atlanta						*Hull (Eng.)*		*Chicago*		
Week Ending	*Prime Crude oil*	*7% Meal**	*Hulls Loose*	*1st cut*	*Linters Clean Mill*	*2nd cut*	*Refined Weekly High—Low†*	*Egyptian crude Weekly High—Low†*	*Prime Crude oil*	*Yellow oil del. Chgo.*	*Edible Carlots*
Dec. 29	3¼c	$21.00	$10	3½—3¾c	2½—3c	2¼—2½c			3 —3½c	4¼c	4¾—5c
Jan. 3	3¾	21.00	11	3¼	2½—3	2¼—2½	16s 3d—15s 9d	13s 9d—13s 3d	3¼—3½	4⅜	4¾—5
Jan. 10	3⅜	21.50	12	3½—4	3 —3¼	2¾—3	16s 3d—15s 6d	13s 9d—13s	3⅜—3½	4½	4¾—5
Jan. 17	3½	21.50	12	3½—4	3 —3¼	2¾—3	15s 9d—15s 3d	13s 6d—13s	3¼—3⅝	4⅝	4¾—5
Jan. 24	3½	23.00	12	3½—4	3¼	3	15s 9d—15s 3d	13s 6d—13s	3¼—3⅝	4¾	4¾—5
Jan. 31	3⅝	24.00	13	4	3¼	3	15s 9d—15s 3d	13s 6d—13s	3¼—3¾	4¾	5½—5¾

*Interior mill points; †per cwt.

Oils and Fats

A stronger tone was apparent in the market for vegetable, animal and fish oils, particularly in the last few days of the month. December weaknesses were finally checked. Stabilization of the dollar at least temporarily at 59.06 plus cents, has had the effect of eliminating much of the uncertainty surrounding future prices. It is expected that a much broader inquiry, manifesting itself in the last 10 days of the month, will cause prices to stiffen and in many items to rise to higher levels. Possibility of a 5c tax on coconut brought out inquiries, but trading failed to show any startling change from the usual routine. In many quarters it is expected that opposition of soap producers will kill the proposal entirely.

Higher prices prevailing in the stock and other commodity markets were matched by higher prices in cottonseed oil, cake and meal markets and for cotton by-products. Strong bullish sentiment brought about higher prices following the fixing of the gold content of the dollar at the 59.06+cents figure. Offerings were generally light in most items, reflecting the feeling in primary centers that still higher prices are inevitable. Speculative interests were much more active than for sometime past. Some liquidating, however, on price ad-

*In this country at least shellac has felt the competition of synthetic resins in the manufacture of phonograph records. In addition, the introduction of the radio cut deeply into the sale of phonograph records.

vances in cottonseed oil, exerted a stabilizing influence. Considerable shifting was reported from near to later months by the speculative element.

Tung Oil Imports

U. S. November Tung oil exports from Hankow totaled 4,686,000 lbs., compared with 9,590,000 lbs. for October and 1,550,000 lbs. for November '32.

November exports of oil from Hankow amounted to 6,154,000 lbs., compared with 12,718,000 lbs. for October and 4,204,000 lbs. for November, '32. Europe took 1,468,000 lbs. during November, compared with 3,128,000 lbs. received the previous month and 2,654,000 lbs. for the corresponding month of '32. Stocks of oil on hand at Hankow the end of November were estimated at 3,340 short tons, a reduction of 1,160 short tons, compared with October and an increase of 2,640 short tons in contrast with stocks on hand the end of November, 1932.

Statistical tabulation below indicates that total exports of oil to the United States for the 1st 11 months of '33 were considerably higher than for the same months of '32:

	Total Exports 1,000 lbs.	*To U. S. 1,000 lbs.*	*Hankow stocks short tons*
November, 1933..	6,154	4,686	3,340
October, 1933...	12,718	9,590	4,500
November, 1932..	4,204	1,550	700
Jan.-Nov. 1933..	135,746	108,010	...

Institute of Paint & Varnish Research, Dr. H. A. Gardner, director, is preparing index of valuable vegetable and fish oils with drying properties. Producers are urged to send data immediately to the Institute in Washington.

Price Comparison, Principal Vegetable, Animal and Fish Oils

Oil	*San Francisco Dec. 26*	*San Francisco Jan. 29*	*Chicago Dec. 29*	*Chicago Feb. 2*	*Baltimore Dec. 29*	*Baltimore Feb 2*	*N. Y. Dec. 29*	*N. Y. Feb. 2*
Vegetable Oils:								
Coconut, crude tanks	2½c[1]*	2⅜c[1]*	2½c*	2⅜c*			2½c*	2⅜*
Chinawood, tanks	6⅞*	7*	7⅛ del.	7½ del.			7¼ del.	7¼ del.
Corn, crude, tanks			3⅜ del.	3¾ del.			3½°	3¾°
Peanut, crude, tanks	7‡	5‡	4¼[1]	4¼[1]			3½[1]	.04[1]
Perilla, tanks	7¾*	7½*	7½*	7⅝*			7½*	.07¾*
Soybean, dom., tanks	7½ del.	6⅝ del.	5½°	5½°			6 1/10°	6°
Soybean, crude Oriental	3½†	3⅝†						
Fish Oils:								
Menhaden, light pressed			5½—6	5¾—6	crude 15	no price	5 3/10	5 9/10
Sardine, tanks	12‡	14‡	17-18 del.	14-16‡			17-18 del	14—16‡
Salmon, tanks	15‡	15‡	16-18 del.	15-17‡			16-18 del	15‡
Whale, tanks								
Herring, tanks	15‡	15‡	17 del.	Nom.			17 del.	15‡
Animal Oils:								
Degras, com. dom			3¼—4	4 —4¼				
com. neut			9¼—9¾	9½—10				
Lard No. 1			6¾—7¼	6¾—7¼				
No. 2			6¼—6¾	6¼—6¾				
Extra			7¼—7¾	7½—7¾				
Oleo No. 1			5½—6	5½—6				
No. 2			4¾—5¼	4¾—5¼				
Tallow, acidless			6½—6¾	6½—6¾				

*f.o.b. tank cars, Pacific Coast Ports; †c.i.f. Pacific Coast Ports, bulk, steamers tanks; ‡f.o.b. tank cars, Pacific mills; °f.o.b. Midwest mills; [1]f.o.b. producing port; n-nominal.

Chemical Specialties

Packaging Exposition

Chemical specialties producers will find much to interest them at the Fourth Packaging, Packing and Shipping Exposition at the Astor, N. Y. City, March 12 to 16. American Management Association is sponsor. Conferences will be held all day Monday, March 12, and the mornings of the remaining days will be devoted to conferences and clinics. Packaging problems arising from the introduction of NRA will be discussed. Grand prize (Wolf Award for best '33 packaging design) and 11 divisional awards will be made.

In taking as a keynote "The Package's Part in Successful Promotion," the Packaging Council which is working out this year's conferences and clinic sessions, plan to emphasize this year the most effective distribution of the package after its completion, the coordination of packaging with promotion and how best to put a new package on the market.

Discuss Code

Manufacturers and jobbers of disinfectants and insecticides selling direct to consumers, who have formed a separate group to formulate trade practices under the general insecticide and disinfectant code, held a meeting Jan. 5 at the offices of West Disinfecting, Long Island City, N. Y. Meeting was under the auspices of a committee of the National Association of Insecticide & Disinfectant manufacturers, headed by M. M. Marcuse, president of West Disinfecting. Other members of the committee are C. C. Baird, president of Baird & McGuire, Inc., Holbrook, Mass. and general adviser to the NRA on the industry; W. B. Eddy of Rochester Germicide, Rochester, N. Y.; S. S. Selig of The Selig Co., Atlanta, Ga.; J. A. Walsh of C. B. Dolge Co., Westport, Conn.

New Specialty Firms

Rodex Chemical has been formed at Charlotte, N. C., to make soaps and disinfectants. Fred E. Lagerholm is president. Niagara Chemical Manufacturing has been organized in Buffalo by Joseph E. Dobson. U. S. Chemical & Exterminating has been formed at Louisville, Ky., (334 Oak st., by Carl Schneider to manufacture and distribute a general line of disinfectants, soaps, janitor supplies, etc. Laundrene Soap, Seattle, has been organized by Robert W. Neal and Henry J. Duffy. The M. V. C. Laboratories, Inc., has been chartered in Toledo, Ohio, to manufacture chemicals and chemical products. Principals are: A. B. Qualy, Forrest Jeffries and Irma Crobin. Royal Soap has been formed at 505 W. 5 st., Kansas City, Mo., by Dr. D. H. Reeder.

Novel Containers

Du Pont's paint and varnish remover now appears with a new label, designed by Arthur S. Allen. Label has a series of steppings of yellow-reds. Johnson and Johnson has repackaged its entire medicinal soap line. Colgate-Palmolive-Peet's new soapless detergent "Artic Syntex" will not be sold in small packages-smallest container being 10 lbs. "Dreft" will be sold in package form.

Now on the Market

Hammond Paint & Chemical, Beacon, N. Y., has a new glossy floor-wax. "Dog Skat" is another new product of this company. It is useful in keeping animals away from valuable shrubbery. Dermakelp Corp., Seattle, has added a new household soap-powder "Dermakelp" to its line. Atlantic Chemical is marketing "Colorwax" through the chain "five and dime" stores.

Shellac Prices. Weekly High-Low

Weeking Ending	*London Mar.† High-Low*	*London May† High-Low*	*U. S. in c. Close of week Mar.*	*U. S. in c. May*	*Calcutta T.N.C. & F. N. Y.**	*N. Y. City in cents Bone Dry 10 bbls.*	*5-9 bbls.*	*1-4 bbls.*	*T. N.*	*Superfine*	*Garnet*	*Shellac Varnish, N. Y. City Orange 5 lb. cut*	*Orange 4½ lb. cut*	*Orange 4 lb. cut*	*White 5 lb. cut*	*White 4½ lb. cut*	*White 4 lb. cut*
Close Dec. 29*...	83s 6d	82s			16 1/16¢	26	27	28	17-17¾	18-18¾	18-18¼	$1.10	$1.05	$1.00	$1.35	$1.30	$1.25
Jan. 5	92s 6d-82s	91s-80s 6d	20¢	19.7	18⅛	29	30	31	21-21¾	23-23¾	24-25	1.20	1.15	1.10	1.45	1.40	1.35
Jan. 12	93s 6d-91s 6d	92s 6d-89s	20.2	20	17¾	29	30	31	21-21¾	23-23¾	24-25	1.20	1.15	1.10	1.14	1.40	1.35
Jan. 19	102s-94s	101s 6d-93s	21	21	18½-19	29	30	31	21-21¾	23-23¾	24-25	1.20	1.15	1.10	1.45	1.40	1.35
Jan. 26	98s 6d-95s	99s-95s	20.6	20.8	18 -18½	29	30	31	21-21¾	23-23¾	24-25	1.20	1.15	1.10	1.45	1.40	1.35
Close Jan. 31	94s	95s			17¼	29	30	31	21-21¾	23-23¾	24-25	1.20	1.15	1.10	1.45	1.40	1.35

†Per cwt.; *Last trading session of the year.

Specialty Co. Notes

The Robert J. King Co., manufacturing chemists, has vacated Stamford plant and is now in South Norwalk. Bon Ami has declared an extra dividend of 50c on class B stock and regular quarterly dividend of 50c payable Jan. 17 to stock of record Jan. 13. Regular quarterly dividend of $1 a share was declared on A stock, payable Jan. 31 to stock of record Jan. 16. Scholler Bros.' new Philadelphia plant (textile soaps, specialties, etc.,) is now in full operation

Holds Annual Convention

Goulard & Olena, Inc., N. Y. City chemical specialties manufacturer, held a 4-day sales meeting ending Jan. 11, attended by all local salesmen as well as those from New England, Pennsylvania, Delaware, and Maryland. Also present were branch managers from Chicago, Cleveland and Boston. Company will have a full line of its products on display at the N. Y. City Flower Show; National House Furnishing Exhibit, Chicago; and Pennsylvania State Exhibition, Pittsburgh.

Alfred W. Hoppenstedt, 55, head of A. W. Hoppenstedt Laboratories, and Cataract Chemical, Buffalo, died Jan. 25. He was an outstanding authority on chemical processes for the tanning industry.

George B. Robbins Co., Boston disinfectant manufacturer, sustained considerable fire damage Jan. 18.

Charles P. McCormick, president of McCormick & Co., manufacturer of botanical products and specialties, Baltimore, has been elected treasurer of the Baltimore Export Managers' Club.

National Association of Insecticide & Disinfectant Manufacturers is opposing Massachusetts House Bill No. 31 which contains stringent restrictions on the marketing of sodium fluoride.

Federal Trade Commission has ordered Delson Chemical, Brooklyn, manufacturer of treatments for dogs, to cease misrepresentations of its product.

Metals and Alloys

Mercury In Distress?

An increased duty on quicksilver to compensate for increased labor costs expected under NRA was asked for on Jan. 22 by domestic producers, acting under provision of the recovery act which permits duty increases to safeguard NRA success.

Producers reported to the Tariff Commission that the Cartel, with 2 years' stocks above ground, was anxious to sell in the U. S. at any price to remove threat of American production. Domestic industry can operate at a profit under a price of about $90 per flask, as compared with $120 charged by the cartel when it enjoyed a virtual world monopoly. Spanish ore contains about 100 pounds of quicksilver per ton, compared with 10 pounds in Italy and only 5 pounds in the United States, they declared. They estimated Spanish costs at $55 per flask and Italian at $60 or $65. Present domestic consumption is 20,000 flasks a year, witnesses estimated, but during the next 10 years should average about 34,000 flasks annually. Domestic production in 1934 was estimated at 11,500 flasks. The witnesses admitted to the commission that their difficulties began before passage of the NRA law. Producers stated that the cartel shipped in more than a year's supply of quicksilver during '33.

Mercury consumers, led by Lavanburg's Fred L. Somers, and General Color's Samuel C. Shearer, requested that if the duty is raised that compensatory increases in the duties on mercury products be made. M. C. A. also filed a brief asking such increases if the mercury duty is raised.

Proposed code for the quicksilver producing industry was presented to NRA Deputy Administrator W. J. Janssen Feb. 2 by W. R. Moorhead, chairman of the executive committee of the National Quicksilver Producers' Association. Only objections were from the labor board, which argued that the Southern wage differential was too great, and from the consumers' board, which contended that the price schedules should be open for public inspection; whereas the code calls for private exchange within the industry.

Code for Manganese Producers

Manganese producers presented a proposed code to NRA on Jan. 26 in a formal hearing before Deputy Administrator Walter A. Janssen. Principal discussion centered around provision which would prohibit importers or foreign producers from selling under the published prices of domestic producers. Code suggests 40 hour week with minimum wage of 30c in the South and 35c in the North and West.

Production, Shipments, Stocks of the Metals

	December 1933†	*December 1932†*	*November 1933†*	*November 1932†*	*October 1933†*	*October 1932†*
Copper production, U. S.	.....	.....	29,000	.....	33,500	.....
Foreign	60,000	.....	67,000	.....	63,500	.....
World total	97,000	.....	97,000	.....	97,000	.....
Copper deliveries, U. S.	.....	.....	22,000	.....	36,500	.....
Foreign	.....	.....	69,000	.....	58,000	.....
World total	.....	.....	.....	.....	94,500	.....
Copper, world stocks	640,000	.....	639,500	.....	633,000	.....
Lead production, U. S.	36,649	.....	38,459	.....	41,803	.....
World total	134,328	.....	132,830	.....	123,562	.....
Lead stocks as month closed	295,704	.....	284,625	.....	.....	.....
Lead, domestic, shipments	26,034	.....	30,681	23,065	33,314	.....
Zinc production, U. S.	32,004	18,653	32,900	16,078	35,195	.....
World total	.....	.....	102,349	.....	107,108	.....
U. S. Shipments, slab zinc	28,517	15,745	27,033	15,970	38,277	.....
U. S. zinc, unfilled orders	15,978	8,478	20,633	8,640	23,360	.....
Zinc stocks, U. S.	104,710	124,856	101,004	121,948	95,137	.....
Zinc stocks, cartel	147,975	.....	141,919	.....	144,192	.....
U. S. retorts oper. end of period	27,190	21,023	28,142	19,753	26,820	.....
Silver production, U. S.*	1,562	1,627	1,863	.....	1,781	.....
World total	13,558	.....	14,158	.....	.....	.....
Tin ship. from cartel countries	.....	.....	.....	.....	6,178‡	.....
World tin visible supply	.....	.....	26,075	47,471	27,940	.....

*In oz., 000 omitted; ‡long tons; †in tons.

Weekly Price Statistics of the Metals

	Lead, Weekly High-Low			*Zinc, Weekly High-Low*			*Copper Weekly High-Low*	*Tin Weekly High-Low*		*Silver Bullion, Weekly High-Low*	
Week Ending	*E. St. Louis*	*N. Y.*	*London per ton*	*E. St. Louis*	*N. Y.*	*London per ton*	*Conn. Valley*	*Straits*	*Standard*	*N. Y.*	*London (pence)*
Close Dec. 3	.04051	.0415		.0435	.0470		8¼	52⅝	52.20	44⅝	
Jan. 5	.04	.0415	£11-	.0425-	.0472-	£14 12s 6d	8¼	53.20-52.75	52.80-52.35	44⅞-43⅞	19⅜-19⅛
	.039	.0400	£10 17s 6d	.0430	.0465	£14 5s					
Jan. 12	.0390	.040	£11 5s	.04275-	.04645-	£14 13s 9d	8	52.35-51.85	51.90-51.40	44⅜-43¾	19⅜-19⅛
			£10 13s 9d	.0425	.0460	£14 3s 9d					
Jan. 19	.0390	.040	£11 17s 6d	.0430-	.0467-	£15 2s 6d	8	52.60-51.25	52.60-.51	45 -44⅜	19¾-19⅞
			£11 3s 9d	.0425	.0460	£14 12s 6d					
Jan. 26	.0390	.040	£11 15s	.0430-	.0467-	£15	8⅜	51.50-.51	51.10-50.525	44⅜-43¼	19⅝-19¼
			£11 11s 3d	.0425	.0460	£14 16s 3d					
Close Jan. 31	.0390	.040	£11 6s 3d	.0430	.0465	£14 16s 3d	.08	51	50.60	44	19½
1934 High-Low	.0405-	.0415-		.0435-	.0470-		.08½-.08	53.25	52.80		
	.0390	.040		.0425	.0460			50.75	50.30		

Zinc dust prices—there is a differential of $0.02 per lb., for carlots above St. Louis zinc market; 5 tons to carload, $0.0275; less than 5 tons $0.325. Closing prices of other metals: antimony 7¼c, 1934 high-low—7¼-7.2c.; mercury, $69.00, 1934 high-low, $69.00-$68.00.

Naval Stores

December steam naval stores production of wood and stocks of these products on hand Dec. 31, according to data collected by the producers' committee, through Arthur Langmeier, of Hercules Powder, secretary, were:—

Production

	Rosin 500-lb. barrels	Turpentine bbls (50 gallons)	Pine oil Gallons
Month of Dec.	40,433	6,916	243,196
Total from April 1, 1933	350,269	55,619	2,224,984

Stocks at Plants

Total, December 31, 1933	73,151	16,433
March 31, 1933	98,615	12,387

Note—Rosin production and stocks include all grades of wood rosin.

Naval stores prices rose sharply in the past month in sympathy with the generally higher price levels prevailing in most of the commodity markets. Turpentine, particularly, exhibited much stronger tendencies. Of special interest was the announcement of higher freight rates on rosin to European ports. Foreign buyers generally failed to get in "under the wire" with orders, despite the fact that in most cases they had received ample warning of the impending advance. Apparently foreign interests were more interested in the dollar, for the fixing by the President of the gold content of the dollar at 59.06 plus cents brought in a fresh wave of buying. In most quarters heavy purchasing by foreign countries is looked for in the next few months. Because of the existing exchange conditions there has been a heavy movement of American stocks to France at the expense of the domestic product, and this has been a heavy contributing factor to bringing down stocks at primary ports here.

December foreign shipments of naval stores included 24,378 bbls. gum spirits turpentine and 2,256 wood, a total of 26,634 bbls., and of rosin 80,349 bbls. gum and 19,974 wood, a total of 100,323 bbls.

There was a very substantial increase in exports of both turpentine and rosin during the 12 months ending Dec. 31, '33, compared with the calendar year '32, as follows:

Spirits Turpentine

	1933	*1932*
Gum	267,758	218,794
S. D. Wood	4,379	3,199
Totals	272,137	221,993

There was, accordingly, an increase in the foreign movement of spirits turpentine in '33 of 50,144 bbls. of 50 gal. each over '32, or nearly 23%.

Rosin

	1933	*1932*
Gum	994,063	937,669
S. D. Wood	218,951	159,965
Totals	1,213,014	1,097,634

There was an increase in the foreign movement of rosins for '33 over '32 of 115,380 bbls., or a little over 10%. Of the increase 56,394 bbls. were gum rosin, and 58,986 bbls. were wood rosin. Outstanding is the increase in foreign movement of S. D wood rosin of 37%, while the increase in gum rosin was only about 6%. Steam-distilled wood rosin quite evidently found new outlets in the foreign trade during '33.

Statistics of the Jacksonville Market

Grade	*Close Dec. 29**	*Jan. 6*	*Jan. 13*	*Jan. 20*	*Jan. 27*	*Close Jan. 31*	*Net Gain or Loss for Month*	*Jan. 27, 1933 Prices*	*Net Gain or Loss in Year*
B	$3.25	3.40	3.40	3.60	3.40-60	3.50	+0.25	1.65	+1.75
D	3.35	3.50	3.50	3.65	3.60-70	3.60	+0.25	1.85	+1.75
E	3.55	3.75	3.80	3.95	4.00	4.05	+0.50	2.35	+1.65
F	3.75	3.85	3.95	4.15	4.10-20	4.15	+0.40	2.77½	+1.32½
G	3.80	3.90	4.00	4.20	4.20-25	4.20	+0.40	2.77½	+1.42½
H	3.85	3.95	4.10	4.30	4.35-40	4.35	+0.50	2.82½	+1.52½
I	3.90	4.00	4.15	4.35	4.45	4.40	+0.50	2.87½	+1.57½
K	4.05	4.15	4.30	4.50	4.50-52½	4.45	+0.40	3.05	+1.45
M	4.25	4.25	4.35	4.50	4.50-55	4.50	+0.25	3.60	+ .90
N	4.25	4.30	4.35	4.50	4.50-60	4.50	+0.25	3.85	+ .65
WG	4.30	4.35	4.50	4.55	4.60	4.55	+0.25	4.35	+ .25
W. W.	4.65	4.75	4.85	4.85	4.90	4.90	+0.25	4.85	+ .05
X	4.65	4.75	4.85	4.85	4.95	4.90	+0.25	5.10	— .15
Market	Firm	Firm	Firm	Firm	Firm	Firm		Firm	
SPIRITS OF TURPENTINE									
Price	43c	45½c	46¾c	48c	48¾c	49c	+6c	39¾c	+9¼c
Market	Firm	Firm	Firm	Firm	Firm	Firm		Firm	

*Last trading day of the year.

Week Ending	*Spirits Receipts*	*Spirits Sales*	*Rosin Receipts*	*Rosin Sales*	*Same as Last Yaer Spirits Receipts*	*Spirits Sales*	*Rosin Receipts*	*Rosin Shipments*
Jan. 6	516	3,737	3,163	6,283	646	497	3,712	11,411
Jan. 13	404	598	2,714	4,153	638	3,954	3,441	3,918
Jan. 20	479	684	3,742	4,422	651	245	2,923	1,789
Jan. 27	589	166	3,939	1,368	2,427	638	3,525	5,754
This month*	1,988	5,187	13,558	16,226	2,427	5,464	13,600	23,167
Since April 1	99,699	104,992	385,153	420,685	90,119	90,068	341,580	349,579
Foreign	.....	87,610	.....	281,878	.....	70,245	.....	243,128
Domestic	.....	17,382	.....	138,807	.....	19,823	.....	106,451

*To Jan. 27 only.

Stocks	*Spirits*	*Rosin*	*Same as Last Year Spirits*	*Rosin*
April 1	36,712	116,429	41,691	155,883
Jan. 1	34,618	83,565	44,335	156,005
Feb. 1	29,535	68,508	41,323	135,166

Statistics of the Savannah Market

Grade	*Close Dec. 28**	*Jan. 6*	*Jan. 13*	*Jan. 20*	*Jan. 27*	*Close Jan. 31*	*Net Gain or Loss for the Month*	*Jan. 26, 1933*	*Net Gain or Loss from a Year Ago*
B	$3.25	$3.35	$3.40	$3.60	$3.55	$3.50	$+.25	$1.65	$+1.60
D	3.35	3.40	3.50	3.70	3.60	3.60	+.25	1.85	+1.50
E	3.55	3.75	3.70	4.00	4.00	4.05	+.50	2.35	+1.20
F	3.75	3.85	3.90	4.20	4.20	4.15	+.40	2.65	+1.10
G	3.80	3.90	3.95	4.25	4.20	4.20	+.40	2.67½	+1.12½
H	3.85	3.95	4.10	4.30	4.35	4.35	+.50	2.72½	+1.12½
I	3.90	4.00	4.10	4.40	4.40	4.40	+.50	2.75	+1.15
K	4.05	4.20	4.20—25	4.55	4.50	4.45	+.40	3.05	+1.05
M	4.25	4.30	4.35	4.55	4.50	4.50	+.25	3.60	+ .65
N	4.25	4.35	4.40—45	4.55	4.50	4.50	+.25	3.85	+ .40
W. G.	4.30	4.35	4.45	4.60	4.55	4.55	+.25	4.35	— .05
W. W.	4.65	4.75	4.80	4.90	4.90	4.90	+.25	4.85	— .20
X	4.65	4.75	4.80	5.00	5.00	4.90	+.25	4.85	— .20
Market	Firm	Firm	Firm	Firm	Firm	Firm		Firm	
Price	42¾c	46c	46¼c	49½c	49c	49½c	+6¾c	40½c	+8½c
Market	Firm	Firm	Firm	Firm	Firm	Firm		Firm	

*Last trading session of the year. Highest turpentine price posted on Savannah Board of Trade, April 1, 1920 at $2.33 a gal., lowest, Sept. 4, 896 at 22c a gal. Lowest 1933 Savannah price, 37c a gal., highest, 50c a gal. Total advance for 1933, 5¾c.

Week Ending	*Spirits Receipts*	*Spirits Sales*	*Rosin Receipts*	*Rosin Sales*	*Same as Last Year Spirits Receipts*	*Spirits Shipments*	*Rosin Receipts*	*Rosin Shipments*
Jan. 6	703	239	4,837	2,133	840		4,702	
Jan. 13	343	132	5,137	1,751	666		3,542	
Jan. 20	461	198	3,879	2,036	486		2,363	
Jan. 27	381	203	2,961	2,031	423		2,625	
Jan. 27-31	198	50	1,445	433	171		1,396	
Month's total	2,086	822	18,259	8,384	2,586		14,628	

Stocks	*Spirits*	*Rosin*
Dec. 29	16,431	106,730
Jan. 31	11,263	90,157

Statistics of the Pensacola Market

Week Ending	*Turpentine Receipts*	*Turpentine Shipments*	*Turpentine Stocks*	*Rosin Receipts*	*Rosin Shipments*	*Rosin Stocks*
Jan. 6	150	363	30,007	783	1,261	19,998
Jan. 13	183	336	29,854	753	925	19,826
Jan. 20	132	449	29,537	636	2,785	17,480
Jan. 27	172	614	29,095	505	3,377	14,608

London Naval Stores Market

Week Ending	*Rosin Weekly High—Low W. W. Grade*	*Turpentine Weekly High—Low*	*American Turpentine Stocks 1934*	*1933*
Close Dec. 29†	17s 6d	42s 6d	17,269	21,509
Jan. 5	17s 6d	44s 6d—43s	16,217	20,667
Jan. 12	17s 6d	45s—44s 6d	15,789	19,814
Jan. 19	17s 6d—15s 3d	47s 6d—45s	14,663	19,187
Jan. 26	15s 6d—15s 3d	47s 6d—46s	15,953	19,153
Feb. 2	15s 6d	47s 9d—46s 9d	15,131	18,502

†Last trading day of the year.

Effective Feb. 2, FF wood rosin is now quoted at $4.25 per 280 lbs. gross or 235 lbs. net, f. o. b. Southern shipping points, for carload lots. On Jan. 17 an advance of 20c was made and a new price of $4.20 announced. On the day previous the price had been advanced 10c, from $3.90 to $4.00

Marketing Agreement Ready

Marketing agreement for the gum turpentine and rosin processors will be executed on Feb. 19, and become effective on that date, Secretary of Agriculture Wallace announced on Feb. 5.

Effective date of the agreement has been postponed 2 weeks, the Secretary explained, to permit processors who have not already signed the pact to do so, thus affording them the opportunity of securing representation on the control committee, which is provided for under the agreement.

Naval Stores' Deaths

M. M. Haygood, well-known naval stores operator at Quitman, Ga., died Jan. 14. L. L. Shaw, prominent naval stores operator at DeFuniak Springs, Fla., was killed in a shooting affray on Jan. 10 and his son seriously wounded.

Rosin-Turpentine Export Figures April-November

	Season—Rosin†				Season—Turpentine			
Country	*1933*	*1932*	*1931*	*1930*	*1933*	*1932*	*1931*	*1930*
United Kingdom	185,566	157,481	175,115	211,748	96,456	81,904	79,060	105,093
Germany	176,044	181,550	160,301	182,563	37,717	19,486	24 091	27,690
Italy	33,973	24,351	23,517	28,322	1,151	868	823	.....
Netherlands	65,433	64,998	48,572	60,429	37,042	29,239	32,990	33,055
Belguim	22,729	17,858	12,077	18,939	10,773	7,525	15,110	22,742
Norway	8,737	7,855	4,147	9,521	.....	.....	.....	.....
Sweden	25,049	19,123	17,197	25,952	.....	.....	.....	.....
South America	117,365	109,689	126,038	173,990	6,171	4,818	9,352	10,429
Japan	57,029	48,113	75,400	62,242	863	524	1,154	898
Dutch East Indies	52,262	32,999	34,343	39,744	.....	.....	.....	.....
Aust. & N. Zealand	14,998	8,314	10,104	10,994	9,765	8,607	8,557	8,109
Canada	39 214	31,291	34,184	38,297	15,800	14,299	16,844	18,424
Cuba	11,751	10,240	12,491	13,162	367	272	354	580
Europe	532,601	478,100	451,161	550,358	186,493	141,121	154,622	189,723
Total outside of Europe	324,139	264,681	316,401	366,434	36,160	31,291	38,203	42,042
Total	856,740	742,961	767,558	916,792	222,653	172,412	192,825	231,765

†In bbls. of 500 lbs. gum and wood rosin. Exports for November may be found by subtracting April-October figures (CHEMICAL INDUSTRIES, Jan., p. 75) from the figures above.

Fertilizers

Nitrogen Prices Paint Higher

Potash importers have extended list prices without discount to May 1, and domestic sellers too have extended list prices indefinitely and are reported to have indicated that no change is contemplated until May 1, although no definite assurances have been given. Newest southwest potash producer is now taking business at figures in line with other producers. Some softening in potash prices in southern territory was reported, but it was said to be largely the result of material offered for re-sale and did not reflect any undue competition between domestic producers. Indications are said to point to a $1 advance in sulfate shortly, but in some quarters it was reported that the current quotation of $25 could be shaded slightly. However, from those close to the market it is intimated that the advance will occur shortly and that a price of $29-$30 is a possibility by mid-year. Bookings of nitrate at recently announced prices were reported in heavy volume. Higher prices for nitrate are also expected. Sale of some 400,000 tons of Chile nitrate to unnamed buyers, but believed to be Russia and Japan, has given added strength to the statistical picture. In general, while the active mixing season is still a few weeks off, the number of inquiries have indicated strongly the almost certain possibility that '34 tonnage will surpass the last few years by a wide margin.

What Are Costs?

Administrative Committee on Jan. 30 adopted 6 regulations which were immediately submitted to NRA for approval. They concern: 1. right of wholesale cooperative associations to purchase fertilizer material from producers or importers who have not filed open price schedules; 2. rights of producers and/or importers of potash, phosphate rock, or nitrogen carriers to sell to wholesale cooperatives without filing an open price schedule; 3. quantity discounts; 4. lists of producers by zones; 5. sworn statement from persons wishing to be included in list of producers; 6. lists of wholesale cooperative associations.

In different parts of the trade it is reported that the old problem of competition from the small local part-time mixer is again cropping up and is likely to prove serious. Question, it is reported, revolves itself around what is and what does constitute cost. With the filing of open schedules completed, it is apparent that the small mixer is in some instances quoting prices that the larger producers feel are unjust and below actual cost. Strong possibility is that the question will come to a head shortly. However, before definite action can likely be taken, larger producers fear that an appreciable volume of the total '34 business will be contracted for.

Personnel

F. F. Ward, I. A. C. vice-president resigned Feb. 1. N. F. A. office manager, able Miss Josephine Feeley, is now assistant secretary of the Code Authority. William V. Kingdon, formerly of Atlanta, now of Indianapolis, has been elected a director and treasurer of E. Rauh & Sons Fertilizer, succeeding Harry Weill.

F. S. Lodge, formerly chief chemist and assistant director of manufacturing for Armour Fertilizer, is now with N. F. A. in charge of the filing of open price schedules. G. Tracy Cunningham, former Armour Fertilizer, Greensboro, N. C. sales manager, is now in Atlanta as assistant to the vice-president in charge of sales.

Welsh Forms New Company

James K. Welsh, for years a partner in H. J. Baker & Bro., withdrew Jan. 1. Henry V. B. Smith, Edward A. Buck, Charles D. Rafferty and Harold S. McCormick, have formed a new partnership.

Mr. Welsh has organized James K. Welsh & Co., with headquarters at 350 Madison ave., to deal in fertilizer materials and chemicals, specializing in chemical and organic ammoniates, potash salts and phosphate materials.

Northwest Organizes

Floyd Oles, Northwest Fertilizer Association manager, has been appointed fertilizer code authority representative in Zone 11b. Permanent organization of the zone occurred Jan. 8 at Tacoma. M. C. Taylor, Magnolia Fertilizer, is chairman. V. G. McKillop, of Balfour, Guthrie & Co., is vice-president, and Floyd Oles is secretary. G. R. Clapp, Swift & Co., North Portland, Ore.; F. E. Peterson, Portland, Ore., and W. R. Lebo, Marine By-Products, Seattle, were made additional members of the administrative committee.

Company Notes

Federal Chemical has purchased fertilizer factory, trade name, and good-will of Meridan Fertilizer at Shreveport and also plant at Meridan, Miss. Hattiesburg plant was not included. Swift has created Swift & Co. Fertilizer Works to handle fertilizer business as a separate and distinct corporation from the rest of the Swift activities. Chairman is G. F. Swift; President is L. W. Rowell, also a Swift & Co. vice-president; Vice-presidents are L. A. Bailer and H. F. Ayer. Jackson Fertilizer's plant (Jackson, Miss.) was destroyed by fire Jan. 3, with loss estimated at $250,000.

A. V. Zama and H. F. Zama, Hazelhurst, Miss., and others, have taken out papers of incorporation for a fertilizer factory

Wyandotte, Mich.
Plant of the Penna. Salt Co.

CHEMICALS FOR INDUSTRY

ACIDS **AMMONIUM PERSULPHATE** **ACID PHOSPHATE** **CHLORINE**

ALUMINUM CHLORIDE **ALUMS** **SODA ASH** **AMMONIA ANHYDROUS**

SALT **BLEACHING POWDER** **CARBON BISULPHIDE** **CAUSTIC SODA**

FERRIC CHLORIDE **KRYOLITH** (*Natural Greenland*) **ALUMINA HYDRATE**

PERCHLORON (*high strength calcium hypochlorite*) **CARBON TETRACHLORIDE**

SODIUM ALUMINATE **SODIUM BICARBONATE** **SULPHATE OF ALUMINA**

Est. 1850

TRADE MARK

PENNSYLVANIA SALT MFG. CO.

EXECUTIVE OFFICES, WIDENER BLDG., PHILADELPHIA, PA.
Branch Sales Offices: New York—Chicago—St. Louis—Pittsburgh—Tacoma—Wyandotte

and mix feed plant. New company will operate as the Hazle Trading. A. V. Zama will serve as secretary and manager. Stockholders of United Chemical, Dallas, have elected following officers: Wm. G. Carroll, president; C. J. George, vice-president; J. A. Hickman, secretary. Prior to his election to the presidency, Mr. Carroll had served as vice-president of the company.

Hitchner Elected

Lucas Kil-Tone's president, L. S. Hitchner, has been elected president of the Agricultural Insecticide and Fungicide Association. He is resigning from Lucas Kil-Tone, and is being succeeded by W. C. Piver. Mr. Piver has been manager of the lawn and garden dept. of V.-C., and at one time was with Lucas-Kil-Tone in a sales capacity. He produced the first calcium arsenate made in this country.

Agricultural Insecticide and Fungicide Manufacturing Industry Code hearing held Feb. 7 in Washington was presided over by Deputy Administrator Herty. A Proposed code submitted by a group of manufacturers claiming to represent 80% of the industry, establishes a basic 40-hour work week, with 48 hours permissible for production departments in peak seasons, and fixes minimum wages of 40c an hour in the North and 35c in the South. Maximum hours section is flexible, providing that employees may work an average of 44 hours, but not more than 48, if necessary to fill orders, and may work on a straight 48 hour schedule in localities where "qualified labor" is not available. Similarly, minimum wage section is qualified by provision that in cases where the rate for the same labor was lower than 40 and 35c on July 15, '29, minimum under code may be as low as 25c.

December Fertilizer Sales

*Equivalent tons

	December				Calendar year			
	P. C. of 1932	1933	1932	1931	P. C. of 1932	1933	1932	1931
South—								
Virginia†	142	3,418	2,400	550	110	307,589	279,904	379,269
North Carolina	155	32,656	21,066	4,348	128	889,310	696,167	1,003,406
South Carolina†	300	32,523	10,845	6,025	130	581,515	446,027	598,866
Georgia	2,413	20,870	865	721	116	416,283	357,352	686,191
Florida†	128	59,941	46,922	47,950	93	352,897	381,178	418,787
Alabama	676	12,850	1,900	1,600	140	287,350	205,400	419,950
Mississippi	1,961	17,650	900	1,450	123	104,191	84,526	197,386
Tennessee†	5,000	100	2	.....	122	76,827	62,956	119,156
Arkansas‡	....	350	....	1,050	128	22,140	17,348	62,096
Louisiana†	3,300	6,600	200	2,200	125	61,514	49,376	94,359
Texas†	5,412	2,706	50	1,420	98	33,571	34,185	64,852
Oklahoma	....	....	....	....	68	1,985	2,925	7,089
Totals, South	223	189,664	85,150	67,314	120	3,135,172	2,617,344	4,051,407
Midwest—								
Indiana	168	106	63	50	122	97,862	80,384	166,005
Illinois	993	278	28	1,415	88	10,420	11,818	32,027
Kentucky	....	....	....	20	106	58,272	55,220	105,192
Missouri	1	1	100	124	123	32,422	26,427	48,944
Kansas	19	5	27	152	68	1,735	2,546	2,983
Totals, midwest	179	390	218	1,761	114	200,711	176,395	355,151
Grand totals	223	190,054	85,368	69,075	119	3,335,883	2,793,739	4,406,558

*Monthly records of fertilizer tax tags are kept by State control officials and are slightly larger or smaller than the actual sales of fertilizer. Figures indicate equivalent number of short tons of fertilizer represented by tax tags purchased and required by law to be attached to each bag of fertilizer sold in the various States. †Cottonseed meal sold as fertilizer included. ‡Excludes 49,940 tons of cottonseed meal for January-December combined, but no separation is available for the amount of meal used as fertilizer from that used as feed.

United States Imports and Exports of Fertilizer and Fertilizer Materials By Classes—Total for All Countries—Long Tons

IMPORTS

	December			Calendar Year		
	1933	1932	1931	1933	1932	1931
Ammonium sulfate	22,801	15,225	21,883	351,254	307,311	114,285
Ammonium-sulfate-nitrate	1	0	2,467	1	0	3,193
Calcium cyanamide	10,386	4,657	2,680	63,842	62,543	51,314
Calcium nitrate	801	1,650	892	17,312	6,860	28,761
Guano	1,675	2,433	74	59,772	24,231	13,849
Dried blood	128	501	390	6,380	3,739	8,835
Sodium nitrate	23,508	48	17,029	122,866	50,430	550,613
Urea and calurea	102	215	893	6,043	3,829	7,131
Ammonium phosphates	476	*	*	4,140	*	*
Tankage	1,628	2,565	1,562	24,777	21,130	22,476
Other nitrogenous	5,048	3,466	3,800	57,497	33,708	49,089
Total nitrogenous materials	66,554	30,760	51,670	713,884	513,781	849,546
Bone phosphates	1,540	3,480	3,395	28,500	30,118	48,979
Superphosphates	289	1,450	*	23,705	21,855	*
Phosphate rock	0	0	*	7,725	6,350	*
All other phosphates	0	0	489	863	8,936	21,743
Total phosphate materials	1,829	4,930	3,884	60,793	67,259	70,722
Muriate of potash	13,966	1,355	6,289	105,538	78,358	180,539
Kainite, 14%	10,039	720	695	43,131	49,374	55,329
Kainite, 20%	12,489	‡	‡	58,858	‡	‡
Manure salts, 30%	9,925	3,596	3,787	113,121	100,927	179,428
Sulfate of potash	3,094	1,450	1,222	45,535	28,071	56,842
Sulfate of pot. magnesia	1,743	*	*	13,790	*	*
Nitrate of potash	343	*	*	25,593	*	*
Other potash	1	7	5	449	351	488
Total potash materials	51,600	7,128	11,998	406,015	257,081	472,626
Nit-phos-and pot. fertilizers	89	387	491	1,875	3,346	10,944
Other fertilizers	4,431	4,755	2,711	67,632	49,245	48,896
Grand total	124,503	47,960	70,754	1,250,199	890,712	1,452,734

EXPORTS

Ammonium sulfate	2,289	49	4,732	14,328	14,742	66,902
Other nitrogenous chemicals†	11,650	16,842	7,145	91,348	166,981	65,829
Nitrogenous organic waste	2,885	1,294	0	11,086	8,927	5,883
Total nitrogenous materials	16,824	18,185	11,877	116,762	190,650	138,614
High grade hard rock	0	178	13,263	42,364	66,009	105,293
Land pebble rock	54,179	48,983	40,152	786,695	547,026	846,012
Total phosphate rock	54,179	49,161	53,415	829,059	613,035	951,305
Superphosphates	4,357	3,027	5,569	35,371	23,883	81,587
Other phosphate materials	1,351	126	229	3,385	1,195	4,008
Total phosphate materials	59,887	52,314	52,213	867,815	638,113	1,036,900
Potash fertilizers	2,595	468	8,225	25,117	1,816	28,982
Concentrr'd Chem. fertilizers	1,962	96	954	15,472	14,565	33,393
Prepared fertilizer mixtures	131	73	200	2,599	1,608	5,778
Grand total	81,399	71,136	80,469	1,027,765	846,752	1,243,667

*Not previously stated separately.
‡Included in kainite, 14%.
†Chiefly domestic synthetic sodium nitrate.

French Nitrate Market?

Allied is reported to be making vigorous protest against Chile receiving the entire 50,000 tons of nitrate order from the French Nitrate Commission. Last year Allied received 25% of the French import quota. It is thought that the new move of the Commission is contingent upon a new Franco-Chilean trade agreement.

Fertilizer Notes

Administration leaders have indicated quite plainly that no objection will be raised to utilizing the normal amount of fertilizer on cotton.

The *N. F. A. News* is now official organ of the Fertilizer Code Authority. C. C. Smith, vice-president and general sales manager Potash Co. of America, (latest domestic potash producer) left Jan. 20 for New Orleans and Chicago. Henry E. Treide, president and 1 of the receivers of Davison Chemical, who has been ill, is now recovered.

Solvents

Important Price Changes

	Jan. 31	Dec. 31
ADVANCED		
Heptanes, mixed	$0.11	$0.10
normal	.14	.12
Hexanes, normal	.14	.11
Petroleums ethers, Group 3	.13	.11
Pentanes, reg. indust'l.	.09	.07
Petroleum thinner, Group 3	.06⅜	.05⅞
Stoddard Solvents, Group 3	.06⅞	.06⅜
DECLINED		
Lacquer, diluents Group 3	$0.06⅞	$0.07⅞
Octanes	.10	.11

The Financial Markets

Prices Go Higher

January trading indicated renewed confidence, better business and greater stability.

In buying activity reminiscent of last July, stocks soared in January, after some irregularity in the first week, to levels close to the high point established for the market in '33. Enhancement in values of stocks on the N. Y. Stock Exchange was 11½%, largest appreciation since August, measured by 240 stocks listed there and arranged in 20 groups by the *N. Y. Times*. An increase of $2,268,904,469 in market prices of these stocks, since the end of December, compared with a gain of $294,784,927, or 1½% in December and $100,837,635 or less than 1% in January, '33.

All groups participated in the market's advance, interest shifting from 1 group to another, even to shares in the low-priced range.

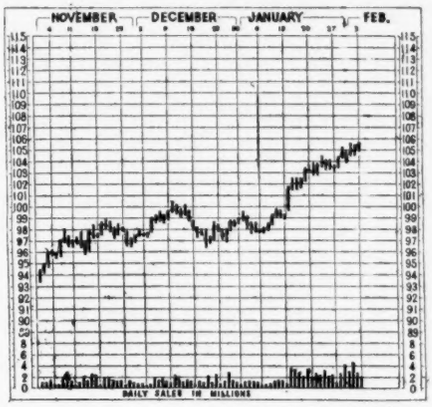
With prices now back to around the July highs, all of the losses sustained over the last half of '33 have been recovered. Market is now at a point where it is 181% above the lows for the depression made in '32, but still 69% below level of prices at the end of September, '29.

Following table shows the changes in the 20 groups—the net average change and change in values:

Group and Number of Issues	January, 1934—Avr. Net Ch'ge in Points	January, 1934—Change in Values
Amusements (5)	+ 1.100	+ $11,653,911
Building equip. (9)	+ 3.014	+ 42,084,211
Business equip. (4)	+ 5.031	+ 30,638,006
Chain stores (14)	+ 3.795	+ 113,908,187
Chemicals (9)	**+ 3.389**	**+ 78,561,647**
Coppers (15)	+ .608	+ 36,547,857
Depart. stores (10)	+ 2.562	+ 20,389,444
Foods (19)	+ 2.585	+ 137,703,963
Leathers (4)	+ 2.812	+ 3,455,941
Mail order (3)	+ 6.625	+ 46,512,924
Motors (15)	+ 1.533	+ 232,197,287
Motor equip. (7)	+ 3.965	+ 23,201,651
Oils (22)	+ 1.574	+ 289,015,117
Public utilities (29)	+ 5.336	+ 495,632,066
Railroads (25)	+ 8.005	+ 450,720,438
Railroad equip. (8)	+ 4.000	+ 41,068,882
Rubber (6)	+ 2.916	+ 16,434,552
Steels (13)	+ 5.731	+ 144,097,957
Sugars (9)	+ 1.639	+ 8,956,599
Tobaccos (14)	+ 4.455	+ 46,123,829
Average and total 240 issues	+ 3.720	+$2,268,904,469

Chemical group participated in the general market rise, all but 1 stock (Texas Gulf Sulphur) registering impressive gains. Street in the past month was particularly bullish on fertilizer stocks. Net appreciation of the group amounted to $78,561,647 compared with $136,153,982 in December, '33. Net changes for the past month were as follows:*

Daily Record of Stock Market Trend



N. Y. Herald-Tribune

Allied Chemical & Dye	$10,805,796
Commercial Solvents	10,222,974
Du Pont de Nemours	42,879,529
Mathieson Alkali Wks	1,300,872
Texas Gulf Sulphur	*952,500
Union Carbide & Carb.	9,226,937
U. S. Industrial Alcohol	2,934,285
Virginia-Carolina Chem.	721,996
Westvaco Chlorine Prod.	1,421,758
Total	+$78,561,647

Du Pont's Bonus Plan

Du Pont stockholders will be asked at their annual meeting on March 12 to ratify action of directors in approving a new form of bonus plan and a new form of executives' stock-purchase and merit-bonus plan. They will be asked also to approve all acts of officers and directors in connection with the administration of these bonus plans in the past.

"Over recent years," Lamont du Pont, president states, in a letter to stockholders, "some doubts have been raised in the minds of the public as to the desirability of plans involving bonuses to corporate employes. The du Pont Company has employed such plans for nearly 30 years, and after this experience is as much convinced as ever regarding the virtue of these plans. It is still quite definitely of the opinion that the policy of rewarding especially meritorious services by some extra form of compensation particularly in a form which involves stock ownership in the company, has been and still is one of the strongest elements in the success of the company."

Mr. du Pont revealed that the average annual bonus payments by the company, under all plans, was $1,819,720 in the period from '27 to '32, inclusive. The following table shows bonus payments in this period:

Year	Total Bonuses All Plans	Net Income Exclusive of Gen. Motors, but Before Deducting Tot. Bonuses	P. C. of Tot. Bonuses To Net Income
1927	$1,283,586	$18,376,804	6.98
1928	2,405,110	28,657,922	8.39
1929	4,098,120	39,409,091	10.39
1930	1,694,040	24,792,169	6.83
1931	1,322,309	24,641,822	5.36
1932	115,155	13,920,077	.82
Average	1,819,720	24,966,314	7.29

Under the bonus plans, 2 classes of awards are permitted. Class A awards, which are made irrespective of the company's earnings, are granted for conspicuous service of any nature, such as inventions or special accomplishments by employes. Class B awards, which are made to employes who have contributed in a general way to the company's success, through loyalty and efficiency, are financed out of a fund which may represent an annual amount not exceeding 7½% of the surplus net receipts above 6% of the capital, employed by the company, excluding assets which are primarily investments.

Under the executives' stock-purchase and merit-bonus plan, men in managerial posts are rewarded through similar distributions based on surplus net receipts each year.

Dividend Action

Vulcan Detinning Co. declared a special $3 dividend (out of income for '33 of a non-operating nature) on common, payable April 20 to stock of record April 10. Last previous payment on the common was 50c on April 20, '32. Company also declared 3 regular quarterly dividends of $1.75 each on the preferred stock, payable April 20, July 20 and Oct. 20, to stock of record April 10, July 10 and Oct. 10, respectively.

International Nickel has declared a 10c dividend on the common, payable March 31 to stock of record March 1. This is the first dividend since 5c was paid Dec. 31, '31.

Columbian Carbon has declared an extra of 25c and the regular quarterly dividend of 50c, payable March 1 to

*Total value of the complete chemical list on the N. Y. Stock Exchange on Feb. 1 amounted to $3,838,756,912 (average price $53.69) compared with $3,615,566,312 on Jan. 1, with an average price of $50.50. Average price on Dec. 1 was $48.45 and $43.52 on Nov. 1. The average chemical price of $53.69 on Feb. 1 compares very favorably with the average of only $28.90 for all listed stocks.

Price Trend of Chemical Company Stocks

	Close Dec. 30	Jan. 5	Jan. 12	Jan. 19	Jan. 26	Close Jan. 31	Net Gain or Loss	1934 High	1934 Low	1933 High	1933 Low
Allied Chem	148¼	146	148	153	154½	152¾	+4½	157⅛	144	152	70¾
Air Reduction	99	97½	98	102	102	102	+3	106¼	95½	112	47½
Anaconda	14⅝	14	13¾	16¼	15⅞	16	+1⅜	17	13½	22⅞	5
Col. Carbon	61½	58¾	60	65¼	64¼	66⅝	+5⅛	68½	58	71½	23⅛
Com. Solvent	31¾	30¾	33¾	33¾	34½	35⅝	+3⅞	36¾	30¼	57¼	9
Du Pont	95⅝	92	92¼	99⅞	99	99½	+3⅞	102	90⅝	96⅜	32⅛
Mathieson	36	32⅞	33½	35¾	38	38	+2	40¾	32¼	46⅝	14
Monsanto	82	83½	82	85	82	80	—2	86⅞	80	83	25
Std. N. J.	45¾	44⅝	44½	46¼	47	47⅛	+1⅝	48¼	44¼	47½	22¾
Texas Gulf S.	40⅛	39⅝	38¼	40½	40	39¾	— ⅜	41½	37¾	45¼	15¼
U. S. I.	53	54⅛	62	58¾	59⅝	59¾	+6¾	62	53½	94	13½

holders of voting trust certificates of record Feb. 16

Capitalization Changes

E. M. & F. Waldo, Inc., dry color manufacturer, Muirkirk, Md., has changed its captalization to 1,000 shares of preferred, par $100, and 4,000 shares of $1 par common stock.

United Dyewood's common, par $10, will be substituted on the N. Y. Stock Exchange for the company's old $100 par common.

Called For Redemption

Westvaco Chlorine has called for redemption a total of $88,000 par value of its 10-year 5½% sinking fund gold debentures due March 1, '37. Debentures, which are each $1,000 in principl amount are to be presented on or after Feb. 19 at the Guaranty Trust, N. Y. City.

Dow Chemical called for redemption on Feb. 1, $500,000 of its outstanding 10-year 6% notes at 101 plus accrued interest.

Foreign Markets

	1933		1934
London	**Nov. 30**	**Dec. 30***	**Jan. 31**
British Celanese.	12s 10½d	13s 6d	13s 1½d
Celanese	£8⅜	£7	£8½
Courtaulds	£2⅛	£2⅛	£2⅛
Distillers	80s 6d	81s 3d	85s 6d
I. C. I.	30s 6d	32s 1½d	32s 9d
Unilever, ord			£1¼
Un. Molasses	13s	1½d	21s 3d
Paris			
Kuhlmann	630	683	610
L'Air Liquide	770	759	720
Berlin			
I. G. Farben	126¼	123	125
Milan			
Snia Viscosa			229½
Montecatini	129½	130½	135½

*London prices Dec. 29.

Over the Counter Prices

	1933				1934	
	Nov. 29		**Dec. 30**		**Jan. 31**	
American Dry Ice	...	...	...	...	1¾	4
American Hard Rubber	7½	11	6	10	6½	10
Canadian Celanese, com	...	...	...	...	18	20
Canadian Celanese, pfd	...	...	...	...	104½	107½
Dixon Crucible	32	37	34	38	40½	44½
Merck, pfd	101½	105½	104	107	107½	111
Tubize Chat., 7%, cum. pfd	...	...	...	...	57	...
Worcester Salt	47¼	53½	...	...	49	53
Young, J. S. pfd	83	...	83	...	85	...
Young, J. S. com	57½	...	56	...	60	65
Intr'nat. Salt 5's, '51	...	...	...	...	89½	91½

Financial Litigation

Virginia Supreme Court of Appeals has granted appeal of George S. Kemp, Thomas B. Scott and others from decree of Richmond chancery court granting petition of Alfred Levinger of New York, that election of Kemp, Scott, Leon M. Nelson, Jaquelin P. Taylor, H. Luther Moon and F. M. Collier as V.-C. directors on Oct. 11, last, was null and void.

Income tax returns of both Silica Gel Corp. and Davison Chemical were introduced as evidence in the trial of $3,800,000 claim by Davison receivers against Silica Gel. Case is before the Wilmington federal district court. Both companies are in receivership.

Dividends and Dates

Name	*Div.*	*Stock Record*	*Payable*
Air Reduction	$0.75	Dec. 30	Jan. 15
Allied Chem. & Dye	$1.50	Jan. 11	Feb. 1
Amer. Cyan. A & B	.25	Jan. 19	Feb. 1
Amer. Home Prods	.20	Feb. 14	Mar. 1
Amer. Smelt. & Ref. 7% 1st pf	$2.50	Feb. 2	Mar. 1
Archer-Daniels-Midland, pf	$1.75	Jan. 20	Feb. 1
Consol. Chem. Indus. pt. pref. A	.37½	Jan. 15	Feb. 1
Corn Prods Refining	.75	Jan. 2	Jan. 20
Corn Prods. Refining pf	$1.75	Jan. 2	Jan. 15
Dow Chemical	.50	Feb. 1	Feb. 15
Dow Chemical pf	$1.75	Feb. 1	Feb. 15
du Pont, deb	$1.50	Jan. 10	Jan. 25
Freeport Texas	.50	Feb. 15	Mar. 1
Freeport Texas, pf	$1.50	Apr. 13	May 1
Freeport Texas, pf	$1.50	Jan. 15	Feb. 1
Hercules Powd., pf	$1.75	Feb. 2	Feb. 15
Int. Nickel of Can. pf	$1.75	Jan. 2	Feb. 1
Liquid Carbonic	.25	Jan. 20	Feb. 1
Liquid Carbonic, com. spec	.25	Jan. 20	Feb. 1
Monsanto Chemical	.31¼	Feb. 24	Mar. 15
National Lead, pf Cl B	$1.50	Jan. 19	Feb. 1
National Lead pf A	$1.75	Mar. 2	Mar. 15
N. J. Zinc Co	.50	Jan. 20	Feb. 10
Owens-Illinois Glass	.75	Jan. 20	Feb. 15
Penn Salt Mfg	.75	Jan. 8	Jan. 15
Shawinigan W. & P.	.13	Jan. 23	Feb. 15
Sherwin-Williams	.50	Jan. 21	Feb. 15
Sherwin-Williams, pf	$1.50	Feb. 15	Mar. 1
Solvay Amer. Invest. pf	$1.37½	Jan. 15	Feb. 15
Vulcan Detinning pf	$1.75	Jan. 13	Jan. 20

Annual and Special Meetings

	Record Date	*Meeting Date*
Air Reduction	Feb. 28	Mar. 14
Commercial Solvents	Jan. 24	Feb. 23
Devoe & Raynolds	Jan. 27	Feb. 14
duPont, E. I. (Spec.)	Feb. 1	Mar. 12
Freeport Texas	Feb. 15	Mar. 12
General Printing Ink	Feb. 1	Mar. 6

Income tax returns were cited to show that Silica Gel reported certain sums as liabilities which Davison receivers claim were owed the Davison company, being carried on the latter's books as assets. C. Wilbur Miller, former president of both companies, admitted he had signed income tax returns as a matter of routine, without reading or even understanding the income-tax return blanks.

Miller Loses

U. S. Supreme Court denied Jan. 9 C. Wilbur Miller, former president, and Ernest B. Miller, former vice-president, of Silica Gel, a subsidiary of the Davision Chemical, now in receivership, permission to file proceedings against Federal District Judge W. Calvin Chesnut. Petitioner sought to proceed by mandamus or writ of prohibition to compel the judge to try by jury a suit brought against Silica Gel by the Pyrites Co., Wilmington, an American affiliate of Rio Tinto, to have the Maryland concern placed in the hands of a receiver.

A petition asking a jury trial on the disputed claims of creditors against Silica Gel was denied by Judge Chesnut in the District Court, last October. Judge Chesnut ruled that no fraud had been shown in the action of its board of directors in assenting to a receivership last April, and that consequently the suit would have to be tried by the court. C. Wilbur Miller and other minority stockholders maintained that fraud had been in evidence. Disputed claims involve principally those of the Pyrites Co., which is seeking to collect by suit approximately $26,000 from Silica Gel receivership.

Glidden is Sued

Glidden is being sued by the government for collection of $2,197,329 allegedly due on industrial alcohol allegedly diverted for beverage purposes. Suit is the 2nd of its kind, another having been started against United States Industrial Alcohol Co. for $8,000,000.

Suit of the government against Glidden is absurd, Adrian D. Joyce, president of the Glidden Co., stated in an interview.

"It is well known," Mr. Joyce said, "that we have long sold lacquer and lacquer thinner to users and to other manufacturers. Several years ago we sold some thinner to a N. Y. manufacturer who was found later to be diverting it into bootlegging channels. With our aid the government traced the alcohol, and when we were named in a suit on advice of counsel we pleaded nolo contendere, paying a $10,000 fine rather than enter into long and expensive litigation. It is this case which has been brought up again. We sold only a few hundred thousand dollars worth of thinner altogether."

Glidden has reduced number of directors to 9. President Joyce reports total sales for past 2 months of the fiscal year 37% ahead of the corresponding period 12 months ago. "Glidden has recently secured some valuable patents in its chemical and pigment divisions in connection with new and unusual pigments that promise additional profits," he stated. "Important announcements will be made shortly."

He reported also arrangements with Extractochemie A. G., Zurich, for rights on patented processes and equipment for vegetable oil production and refinement, promising better products and economies. Control of Nelio-Resin, Jacksonville, (with new plant for producing nelio-resin from crude gum) has been acquired. Glidden is considering reopening several mining properties.

5% Bonus

J. K. Kurfees, Louisville, paid a bonus of 5% of the annual salary to all employees at the beginning of the year. For the previous 3 years the bonus has been omitted.

Who Pays the Bill

Chemical and allied industries once more takes high place in helping to pay "Uncle Sam's" bills. The '32 corporation returns recently classified by groups show that in the industrial section only 2 other surpassed the chemical and allied fields in income tax paid and they were food products, including beverages and tobacco products. Details are given at the bottom of the following page.

Earnings at a Glance

Company	Annual	Net Income 1933	Net Income 1932	Common Share Earnings 1933	Common Share Earnings 1932
Air Reduction:					
December 31 quarter	‡$3.00	$1,055,407	$626,628	$1.25	$0.74
Year, December 31	‡3.00	3,192,732	2,293,760	3.79	2.73
American Agricultural Chem.:					
December 31 quarter	f....	†141,440	†408,986	...	...
Six months, December 31	f....	†373,349	†762,118	...	...
Archer-Daniels-Midland:					
December 31 quarter	1.00	563,276	209,668	.92	.28
Six months, December 31	1.00	927,578	415,831	1.47	.54
Atlas Powder Co.:					
Year, December 31	f....	709,334	42,072	.76	p.46
Canadian Industrial Alcohol:					
Year, September 30	f....	x21,565	x369,440	...	...
Devoe & Reynolds, Inc.:					
Year, November 30	‡1.00	656,336	21,765	c3.78	s1.62
duPont de Nemours & Co., E. I. (DD):					
Year, December 31	‡2.00	38,895,330	26,234,778	j3.00	j1.82
Hercules Powder Co.:					
Year, December 31	‡1.50	2,363,055	889,763	2.79	.24
Shawinigan Water & Power Co.:					
Year, December 31	.50	*1,843,044	*2,534,472	...	...

‡Plus extras; fNo common dividends; †Net loss; pOn preferred stock; xLoss before depreciation; cOn combined Class A & B shares; sOn 1st preferred stock; jOn average shares; *Profit before federal taxes.

Company Reports

Hercules Nets $2.79 a Share in Part Year

Hercules Powder in report for year ended Dec. 31, '33, certified by independent auditors, shows net income of $2,363,055 after depreciation, federal taxes, etc., equivalent after deducting $739,656 7% preferred dividends paid, to $2.79 a share on 582,679 no-par shares of common stock, excluding 23,585 shares held in treasury. This compares with net income in 1932, of $889,763 or 24c a common share.

Current assets as of Dec. 31, '33, including $7,305,427 cash, U. S. government and other investment securities, amounted to $16,897,582 and current liabilities were $945,501. This compares with cash, U. S. government and investment securities of $6,998,727, current assets of $14,624,988 and current liabilities of $575,935 at close of '32.

Consolidated Chemical Industries reports for year ended Dec. 31, net profit of $445,902 after depreciation, federal taxes, etc., equivalent under participating provisions of shares to $1.56 a share on combined 205,000 shares of Class A stock and 80,000 shares of Class B stock. In preceding year net profit was $312,253, equal after allowing for dividend requirements of $1.50 for the participating Class A stock to 6 cents a share on Class B. stock.

Class A preference stock is preferred as to dividends of $1.50 per share per annum and participates equally share for share with Class B after latter has received $1.50 per annum.

du Pont Earnings Rise Sharply in 1933

Du Pont and wholly owned subsidiaries for year ended Dec. 31, '33, certified by independent auditors, shows net income of $38,895,330 after depreciation, obsolescence, interest and federal taxes, etc., comparing with $26,234,778 in '32. After deducting debenture dividends and including $570,878 company's equity in undivided profits or losses of controlled companies not consolidated there was a balance available for common stock in '33, of $32,921,253 equivalent to $3.00 a share (par $20) on 10,983,379 average number of common shares outstanding during the year. This compares with balance available for common stock in '32, including $63,915 equity in undivided profits or losses of controlled companies, of $19,769,395 equal to $1.82 a share on 10,867,678 average common shares outstanding during that year.

Profit and loss surplus on Dec. 31, last, totaled $170,345,234 against $178,717,374 at end of preceding year. Consolidated balance sheet as of Dec. 31, '33, shows total assets of $605,631,064 comparing with $595,486,070 at close of '32. Current assets, including $76,848,927 cash and marketable securities, amounted to $129,771,060 and current liabilities were $16,601,263. At end of preceding year, cash and marketable securities were $62,702,400, current assets totaled $107,325,753 and current liabilities were $10,630,857. Current assets as shown above do not include investment in General Motors Corp. common stock.

	1933	1932	1931	1930
Profit	$37,262,303	$23,363,886	$33,608,367	$33,811,682
Depr. & obsol.	12,904,102	13,009,753	12,499,015	12,066,175
Inc. from op.	$24,358,201	$10,354,133	$21,109,352	$21,745,507
G M divs.	12,500,273	12,500,273	29,942,929	32,936,529
Misc. inc.	5,565,214	4,448,022	4,434,673	3,716,982
Total inc.	$42,423,688	$27,302,428	$55,486,954	$58,399,018
Fed. tax prov.	3,459,824	997,234	2,224,511	2,364,359
Interest	68,534	70,416	72,383	72,650
Net income	$38,895,330	$26,234,778	$53,190,060	$55,962,009
Deb. divs.	6,544,955	6,529,298	6,189,874	5,971,980
Com. divs.	30,245,663	29,939,930	44,074,280	46,089,833
Surplus	$2,104,712	§$10,234,450	$2,925,906	$3,900,196
Prev. surp.	178,717,374	198,933,044	208,082,665	144,920,215
Srp. from com. stock	**4,023,148	.....	.....	*7,767,060
Prem. on com. stock	.....	.....	3,120	21,353,220
Surp. from acq.	.....	.....	1,759,495	7,684,229
G. M. stk. adj.	†14,500,000	†9,981,220	8,484,037	22,457,745
Total surp.	$170,345,234	$178,717,374	$204,287,149	$208,082,665
Surp. appro.	.....	.....	‡5,354,105	.....
P & L surp.	$170,345,234	$178,717,374	$198,933,044	$208,082,665

*Surplus resulting from the issue of common stock sold under executives' trust and bonus plans. †Debit; the value of du Pont company's investment in General Motors Corp. common stock was adjusted on the books of the company in March, 1933, to $154,500,000 ($15.45 a share) and in March, 1932, to $168,682,618 ($16.90 a share), which closely corresponded to its net asset value as shown by the balance sheets of General Motors Corp. at December 31, 1932, and December 31, 1931, respectively. ‡Appropriation to adjust book value of patents to nominal account. §Deficit. **Adjustment resulting from disposition of the company's common stock previously purchased.

Air Reduction and wholly owned subsidiaries report for year ended Dec. 31, shows consolidated net profit of $3,192,732, after federal taxes, depreciation, etc., equivalent to $3.79 a share on 841,288 no-par shares of capital stock. This compares with $2,293,760, or $2.73 a share, in 1932. For quarter ended Dec. 31, '33, consolidated net profit was $1,055,407, after charges and federal taxes, equivalent to $1.25 a share, comparing with $1,037,402, or $1.23 a share, in preceding quarter, and $626,628 or 74c a share, in Dec. quarter of '32.

Chemical Industry's Income Tax Large

Industrial Groups	Total Number of Returns	Returns Showing Net Income: No.	Gross Income*	Net Income	Net Loss for Prior Year	Income Tax	Returns Showing No Net Income: No.	Gross Income*	Deficit	Active Corporations
Agriculture & related industries	10,327	1,147	$127,765,726	$5,943,509	$1,027,469	$610,096	8,050	$206,933,619	$87,271,109	1,130
Mining and quarrying	16,425	2,771	490,684,769	57,722,711	4,744,927	7,306,390	8,786	822,661,455	206,795,243	4,868
Manufacturing:										
Food products, including bev	14,151	3,424	3,452,973,005	158,316,875	16,299,121	19,555,446	10,099	1,985,790,592	177,526,748	628
Tobacco products	368	112	1,004,340,631	140,257,354	39,031	19,317,036	244	48,468,624	4,427,525	12
Textiles and their products	13,551	2,277	1,068,773,122	34,276,899	2,822,166	4,267,532	10,992	2,379,429,333	296,513,417	282
Leather and its manufactures	2,165	426	338,392,249	16,432,274	363,572	2,199,423	1,697	435,606,486	56,605,694	42
Rubber products	509	90	125,871,817	2,594,930	582,889	276,022	398	405,725,640	31,182,983	21
Forest products	6,428	519	93,118,512	5,110,435	375,313	647,014	5,685	699,726,409	196,574,471	224
Paper, pulp and products	1,967	450	281,837,710	16,289,108	445,787	2,207,852	1,479	545,498,949	68,013,356	38
Printing, publishing & allied ind	11,471	2,083	698,216,315	55,754,524	2,265,444	7,384,876	8,988	794,550,104	86,163,916	400
Chemicals and allied prod	**6,934**	**1,618**	**2,186,391,313**	**134,321,417**	**5,323,471**	**18,051,121**	**4,955**	**1,335,895,470**	**118,952,364**	361
Stone, clay and glass products	4,096	409	177,195,447	12,799,469	377,690	1,702,191	3,535	462,681,929	104,623,590	152
Metal and its products	17,770	1,791	794,343,082	59,127,079	2,083,188	7,882,609	15,259	3,649,094,229	843,496,990	720
Manuf. not elsewhere classified	6,984	890	293,013,270	21,683,228	783,161	2,911,692	5,313	589,239,741	119,142,746	781
Total manufacturing	86,394	14,089	$10,514,466,473	$656,963,592	$31,760,833	$86,402,814	68,644	$13,331,707,506	$2,103,223,800	3,661

The Industry's Securities

1934 January Last	1934 January High	1934 January Low	1933 High	1933 Low	1932 High	1932 Low	Sales In January	Sales During 1934	Stocks	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1933	Earnings $-per share-$ 1932
									Number of Shares					
NEW YORK STOCK EXCHANGE														
106¼	95½	112	47½	63½	30⅞		26,800		Air Reduction	No	841,288	$3.00x	3.79	2.73
157⅛	144	152	70¾	88½	42½		32,800		Allied Chem. & Dye	No	2,401,288	6.00		3.62
126	122¼	125	115	120†	96½		1,200		7% cum. pfd.	100	392,849	7.00		
36	25¼	35	7¼	15½	3½		40,400		Amer. Agric. Chem.	100	315,701	None		—p3.86
62½	51½	89⅞	13	27	11		196,000		Amer. Com. Alcohol	20	260,716	None		3.01
30	26½	29½	9¾	15½	7		5,500		Archer-Dan.-Midland	No	541,546	1.00	1.82	q1.44
45	35½	39½	9	25½	7*		15,800		Atlas Powder Co.	No	234,235	None		—2.14
91	83	83½	60	79½	45½		430		6% cum. pfd.	100	88,781	6.00		
43½	33⅞	58⅞	4½	12⅝	1¼		242,000		Celanese Corp. Amer.	No	987,800	None		—.85
14⅜	9⅜	22⅜	7	31½	10¼		89,200		Colgate Palm-Peet	No	1,999,970	None		—.74
76	68½	88	49	95	65		1,100		6% pfd.	100	254,500	6.00		
68½	58	71½	23⅛	41⅞	13½		23,700		Columbian Carbon	No	538,154	2.00		1.83
36¾	30¼	57¼	9	13¼	3½		811,300		Commer. Solvents	No.	2,635,371	.60		.51
84½	72¼	90⅝	45⅜	55⅜	24¼		39,200		Corn Products	25	2,530,000	3.00		2.77
140	135	145¾	117½	140	99½		360		7% cum. pfd.	100	243,739	7.00		
40⅜	29	33⅞	10	16½	7		14,200		Devoe & Rayn. A.	No	95,000	h1.00		—r1.00
102	90⅜	95⅞	32½	59½	22		319,900		DuPont de Nemours	20	10,871,997	i2.00		1.81
119½	115	117	97½	105½	80⅜		4,500		6% cum. deb.	100	1,092,699	6.00		
91	79	89⅜	46	87½	35¼		24,900		Eastman Kodak	No	2,250,921	3.00		2.52
125	120	130	110	125	99		460		6% cum. pfd.	100	61,657	6.00		
48¾	43⅜	49⅜	16⅛	28⅜	10		24,800		Freeport Texas	10	729,844	2.00		3.01
160⅛	150⅛	160⅛	97	...	...		900		6% conv. pfd.	100	25,000	6.00		
19⅛	15⅜	20	3¾	10¾	3⅛		86,200		Glidden Co.	No	603,304	1.00	1.45	—s.66
88	83	91½	48	76	35		615		Glidden, pr. pfd.	100	63,044	7.00		
96¾	87¼	85½	65	...	...				Hazel Atlas	25	411,065	4.00		5.58
69	59	68⅝	15	29½	13⅞		6,700		Hercules Powder	No	582,679	1.50		—.24
115	111	110½	85	95	70½		210		7% cum. pfd.	100	105,765	7.00		
96¾	74¾	85	24	40	7⅛		46,800		Industrial Rayon	No	200,000	4.00		1.39
4⅜	2	5⅞	⅞	3½	½		33,800		Intern. Agricul.	No	436,049	None	—4.04	—q4.47
33	15	23½	5	15	3¾		9,500		7% cum. pr. pfd.	100	100,000	None		
23¾	21	23¼	6¾	12½	3½		395,700		Intern. Nickel	No	14,584,025	None		—.14
25¼	21	27¼	13½	23½	9¼		6,000		Intern. Salt	No	233,820	1.50		2.20
19½	15⅜	22	7½	11	8		3,900		Kellogg (Spencer)	No	500,000	1.00	.98	—v.26
43¼	34½	37⅜	4⅜	9⅜	3½		259,000		Libby Owens Ford	No	2,331,522	1.20		—.13
32½	27	50	10¼	22	9		29,800		Liquid Carbonic	No	342,406	1.00		—u1.29
40¾	32½	46⅝	14	20⅞	9		181,600		Mathieson Alkali	No	t650,436	1.50		.86
86⅞	80	83	25	30¾	13⅜		10,000		Monsanto Chem.	10	427,116	k1.25		2.37
141½	136	140	43½	92	45		2,500		National Lead	100	309,831	5.00		3.15
131½	122	128½	101	125	87		800		7% cum. "A" pfd.	100	243,676	7.00		
103	100⅛	109½	75	105	61		300		6% cum. "B" pfd.	100	103,277	6.00		
8¾	6	11¼	1⅜	3¾	1½		10,500		Newport Industries	1	519,347	None		—.77
94	78½	96⅜	31½	42½	12		25,900		Owens-Illinois Glass	25	1,177,173	3.00		1.80
41¼	36	47½	19⅜	42¾	19⅞		53,100		Procter & Gamble	No	6,410,000	1.50	1.52	q1.26
106	102½	110¾	97	103½	81		1,145		5% pfd. (ser. 2-1-29)	100	171,569	5.00		
6¼	4⅛	7½	1⅜	4⅜	1		12,600		Tenn. Corp.	5	857,896	None		—.89
41⅜	37⅜	45½	15½	26½	12		97,900		Texas Gulf Sulphur	No	2,540,000	2.00		2.33
50⅞	45	51⅞	19½	36⅜	15½		169,900		Union Carbide & Carbon	No	9,000,743	1.00		.98
39⅜	35	37¾	10¼	18	6⅜		32,000		United Carbon	No	370,127	1.60		—.03
64	53½	94	13½	36¼	13¼		105,500		U. S. Indus. Alco.	No	381,813	None		—3.54
28¾	21	36½	7½	23¼	5¼		73,000		Vanadium Corp.-Amer.	No	366,637	None		—4.36
5⅜	3½	7⅜	⅜	2⅜	½		24,800		Virginia-Caro. Chem.	No	486,000	None	—4.93	—q5.73
24½	14½	26½	3⅜	11¼	3⅜		1,100		6% cum. pact. pfd.	100	213,392	None		
70	59¾	63½	35¾	69¾	20		1,000		7% cum. prior pfd.	100	60,000	None		
23¾	14⅞	20½	5	12⅝	3		12,100		Westvaco Chlorine	No	282,962	.40		.80
NEW YORK CURB EXCHANGE														
19⅜	15½	16½	3¼	8½	1⅜		130,700		Amer. Cyanamid "B"	No	2,404,194	m1.00		.14
3⅜	3¼	4½	1	2½	⅜		3,700		British Celanese Am. R.C.R.	243		None		
103½	93½	110	27	55	8		1,175		Celanese,7 % cum. par 1st pfd	100	146,804	o3.50		1.27
88¼	83	90	51	64½	17		475		7% cum. prior pfd.	100	114,818	7.00		8.64
19	12½	26⅞	2	5⅜	1½		2,825		Celluloid Corp.	15	194,952	None		—3.79
11½	10⅜	11⅜	4⅛	6⅜	4⅜		6,900		Courtaulds' Ltd.	1£	24,000,000	4¼%		w.26
76⅜	73½	78	30	39	21½		2,200		Dow Chemical	No	630,000	2.00	1.99	2.95
6	4	8	½	1½	¼		4,800		Duval Texas Sulphur	No	500,000	None		z.30
20	19	19	8	...	...		700		Heyden Chem. Corp.	10	147,600	1.00		1.23
48⅞	39	39⅞	13	19½	12⅛		25,925		Pittsburgh Plate Glass	25	2,141,305	1.00		—.03
62½	47¼	47	12⅞	35	17½		24,825		Sherwin Williams	25	635,583	2.00	y3.54	
103	100	99	80	100⅛	75		130		6% pfd. AA. cum.	100	155,521	6.00		
CLEVELAND STOCK EXCHANGE														
76	72½	78	30	40	21½		1,575		Dow Chemical	No	630,000	2.00	1.99	f2.95
									pfd.	100	30,000	7.00	69.03	x48.77
PHILADELPHIA STOCK EXCHANGE														
61¼	56	38*	25¼	40	19⅞		575		Pennsylvania Salt	50	150,000	3.00	2.17	2.42

1934 January Last	1934 January High	1934 January Low	1933 High	1933 Low	1932 High	1932 Low	Sales In January	Sales During 1934	Bonds	Date Due	Int. %	Int. Period	Out-standing $
NEW YORK STOCK EXCHANGE													
99½	93½	95	70½	80	62		186,000		Amer. Cyan. deb. 5's	1942	5	A. O.	4,411,000
92	83½	89	64	80	54¼		372,000		Amer. I. G. Chem. Conv. 5½'s	1949	5½	M. N.	29,929,000
11	5	14¼	2½	18	1		550,000		Anglo Chilean s. f. deb. 7's	1945	7	M. N.	12,700,000
73¼	61½	74¼	37	60	34⅜		35,000		By-Products Coke Corp. 1st. 5½'s "A"	1945	5½	M. N.	4,932,000
101⅜	100½	104½	100½	104⅞	100⅝		31,000		Corn Prod. Refin. 1st. s. f. 5's	1934	5	M. N.	1,766,000
71	62	65	38½	54⅛	32		19,000		Int. Agric. Corp. 1st. Coll. tr. stamped to 1942	1942	5½		5,994,100
16	5¼	14⅞	2½	15½	¼		2,639,000		Lautaco Nitrate conv. b's	1954	6	J. J.	31,357,000
98½	97	99⅛	87	97¼	67		33,000		Montecatini Min. & Agric. det. 7's with warrants	1937	7	J. J.	7,075,045
64	52½	62	33¾	59	17		121,000		Ruhr Chem. s. f. 6's	1948	6	A. O.	3,156,000
100	98	99½	87	90	66		99,000		Solvay Am. Invest. 5% notes	1942	5	M. S.	10,062,000
76½	65½	76	50	66	39		16,000		Tenn. Corp. deb. 6's "B"	1944	6	M. S.	3,007,900
74	62	81	34¾	75	30		121,000		Vanadium Corp. conv. 5's	1941	5	A. O.	4,261,000
NEW YORK CURB EXCHANGE													
102	101⅜	103½	101	103½	99		4,000		Westvaco Chlorine Prod. 5½'s	1937	5½	M. S.	1,393,000

*Plus 75c extra; fYears ended 5-31-32-& 33; hPlus 25c ended 5-31-32-& 33; iPlus 75c ended 5-31-32-& 33; jPlus 75c ended 5-31-32-& 33; kPlus 75c ended 5-31-32-& 33; mIf rate of last quarter be cont.; oLast dividend, $12.50 in arrears expected to be declared; pYear ended 6-30-32; qYears ended 6-30-32 & 6-30-33; rYear ended 11-30-32; sYears ended 10-31-32 & 33; tBefore issue, rights; uYear ended 9-30-32; vYears ended 9-2-32 & 33; w@ $4,866 to the £; xYears ended 5-31-32 & 33; yYear ended 8-31-33; zYear ended 8-13-32.

The Trend of Prices

Business Consolidates Gains

Business activity, after a slight hesitancy in the first 2 weeks of the month, has gained rapidly, and a feeling of greater optimism has taken hold, despite the admitted dangers attending the terrific spending program mapped out and in operation by the government. Retail trade has rushed ahead, helped by a number of factors, including real winter weather, and the "pump-priming" of the government. Dun and Bradstreet report January retail trade ahead of the same month a year ago by 10 to 35%. In the South and West where the government money and processing tax money and other forms of special tax relief funds are being dispensed in greatest volume, are the sections where the best retail selling conditions are to be found. Wholesalers are feeling this pleasant kick-back in the way of larger reorders. Salesmen in large numbers are appearing on the road for the first time in 2 years. Stocks on dealers' shelves are small and business is being taken with prices advancing in practically every line of production.

Heavy Industries Improve

So-called heavy industries are smartly keeping in step. Steel activity is steadily rising, automotive companies are being pressed to keep up with orders. Glass industry continues very active. Rise in building projects indicate bright future for the paint, glass, steel and other important supplying industries, although admittedly most of the total again represents government "pump-priming."

Fixing of the gold content of the dollar at the new figure of 59.06 plus cents while not particularly pleasing to large numbers, has at least taken away in a large measure the uncertainty that was causing business to stagnate when it should have been moving ahead at a rapid pace. Immediate effect of the operation of officially cutting the dollar approximately in half was a general rise in the stock market and in the host of commodity markets scattered throughout the country.

Practically all of the major business indices reflect the better state of business. Carloadings, electric output, bank-clearings and commodity prices are ahead of the same period of a year ago. The *N. Y. Times* index (corrected for normal seasonal variation), while showing a net loss for the month, stood at 77.2 on Jan. 27, compared with only 66.7 on Jan. 28, '33.

Outlook For Chemical

Immediate outlook for the majority of the industries which are heavy consumers of chemicals is particularly bright. Paint varnish and lacquer demand is expected to be the best in several years with construction and automobile production already moving ahead. The farmer, with more money at hand and with the necessity in most cases of restricting his acreage to comply with the government's regulations, will invest heavily this spring in fertilizer and will go in for intensive farming on a scale fertilizer companies have always hoped for but never quite succeeded in obtaining, despite splendid publicity. Steel, tire, leather, paper and glass fields are expected to show sizable gains in the next 60 days.

In most quarters it is felt that the immutable economic laws, including the most important, supply and demand, are now exerting pressure on the upward side. Whether NRA, PWA, CWA, and all the other initialed bureaus or the natural economic forces are responsible for recovery, no one will perhaps ever know definitely, and certainly the vast majority will be to busy to argue abstractly about the question. However sentiment is definitely much better. Yet the way back to anything like normalcy is long and treacherously slippery. The huge government debt and present and proposed spending programs are viewed in many business quarters as dangerous crossroads that must be traversed very shortly.

Akron tire factories boosted wages of 40,000 from 10% up and increased production to a 6-day week.

Monthly and Weekly Business Statistics

	December 1933	December 1932	November 1933	November 1932	October 1933	October 1932
Auto Production	84,045	85,858	63,904	59,557	138,475	48,702
Bldg. Contracts*‡	$207, 09,500	$81,219	$162,330	$105,302	$145,367	$107,273
Coal, soft, output, tons	29,600,000	31,522,000	30,582,000	30,632,000	29,656,000	32,677,000
Beehive coke, output, tons	.....	.....	.....	.....	45,000	67,600
By-product coke, output, tons	.....	.....	.....	.....	2,559,265	1,738,716
Cotton consumption, bales	349,000	.....	475,000	503,722	503,873	501,893
Factory employment†	70.1	58.3	72.4	61.2	74.0	59.9
Payroll totals†	49.8	37.7	53.6	41.8	53.6	39.9
Failures, Dun & Brad.	1,132	2,469	1,237	2,440	1,206	2,273
Merch. Imports‡	$133,000	$97,087	$128,000	$104,468	$151,000	$105,499
Merch Exports‡	$192,000	$131,614	$184,000	$138,534	$194,000	$153,090
Newsparint Prod. (Cn.) tons	175,304	138,682	193,718	161,334	191,452	157,506
Newsprint Prod, U. S.	80,895	80,075	87,567	81,662	82,052	76,731
Newsprint Prod., Newfoundland	26,030	21,704	26,538	21,195	25,916	20,641
Newsprint Prod., Total	283,833	241,365	309,244	265,035	300,904	256,076
Newsprint Ship. (Can.) tons	172,285	140,770	201,102	164,327	190,326	157,568
Newsprint Ship., U. S.	82,031	79,002	86,829	83,922	81,580	76,922
Newsprint Ship, Total (Can. & U. S.)	254,316	219,772	287,391	248,249	271,906	234,490
Newsprint stocks (Can.) tons	33,847	54,214	30,858	48,461	37,237	48,062
Newsprint stocks, U. S.	18,566	32,709	19,676	32,790	19,152	33,095
Newsprint stocks, Total (Can. & U. S.)	52,413	86,923	50,534	81,201	56,389	81,157
Plate Glass output, sq. ft.	6,346,645	4,267,908	4,169,442	4,510,960	5,793,693	3,935,416
Shoe Production, pairs	.....	.....	.....	25,148,928	31,397,954	33,069,741
Steel Ingots	1,819,648	861,034	1,540,882	1,032,221	2,111,842	1,087,058
Tire Shipments	.....	1,454,960	2,197,485	1,711,298	2,536,971	1,799,136
Tire Production	.....	1,586,145	3,039,386	2,303,545	3,428,658	2,568,641
Tire Inventory	.....	6,115,487	9,246,563	7,454,443	8,461,735	6,875,980
Chemical						
Elect. Energy consumption°	.....	.....	163.0	130.1	158.9	119.0
Stocks, mfg. goods°	.....	.....	116	121	121	122
Stocks, raw materials°	.....	.....	121	122	116	122
Chemical Prices						
Dept. Labor chem. price index†	79.2	79.7	79.2	79.7	78.6	79.8
Dept. Labor fert. price index†	68.1	63.1	67.8	63.5	67.6	63.4
Dept. Labor mixed fert. price index†	69.9	65.6	68.5	65.6	68.3	66.5
Chemical Employment						
Dept. Labor chem. & allied emp†	97.3	77.2	98.1	76.0	98.7	75.7
Dept. Labor chem. emp.†	121.3	84.6	121.9	85.3	120.9	84.7
Dept. Labor fert. emp.†	75.1	43.5	72.0	46.0	72.1	45.1
Dept. Labor paints & varnish emp.†	77.0	65.7	77.8	67.1	80.4	68.2
Dept. Labor pet. ref. emp†	74.2	62.5	73.4	61.5	72.7	61.8
Dept. Labor rayon emp.†	191.8	146.9	197.7	142.8	197.3	139.6
Dept. Labor soap emp.†	106.9	94.5	112.1	98.3	116.7	96.9
Chemical Payrolls						
Dept. Labor chem. & allied prod†	.....	.....	76.9	60.8	77.8	60.9
Dept. Labor chemical†	87.9	59.8	86.3	61.6	87.0	61.7
Dept. Labor fertilizer	48.1	30.4	44.2	30.8	48.0	30.1
Dept. Labor paint & varnish†	59.4	49.3	58.9	51.7	61.0	54.6
Dept. Labor pet. ref.†	59.8	51.8	60.1	52.0	59.8	52.2
Dept. Labor rayon†	174.5	122.5	172.9	120.2	172.4	118.3
Dept. Labor soap†	88.2	79.2	91.6	83.0	92.6	84.4

*37 states, F. W. Dodge Corp., ‡—000 omitted; °—monthly average 1923-25 = 100, Dept. of Commerce; †Dept. of Labor, 1926 = 100.

Weekly Business Statistics

Week Ending	Carloadings 1934	Carloadings 1933	Electrical Output* 1934	Electrical Output* 1933	Journal of Commerce Price Index‡	National Fertilizer Association Indices: Metals	Fats & Oils	Chem. & Drugs	Mixed Fert.	Fert. Mat.	All Groups	Dept. of Labor Chem. & Drug Price Index	Steel Activity %	Fisher's Index Purch. Power
Jan. 6	449,939	439,469	1,563,678	1,425,639	71.9	79.1	41.5	88.2	66.6	72.8	68.6	73.3	30.7	138.9
Jan. 13	555,627	509,893	1,646,271	1,495,116	72.1	78.7	44.3	88.2	66.5	72.8	69.1	73.5	34.2	138.9
Jan. 20	560,430	499,554	1,624,846	1,484,089	73.1	79.0	45.7	93.0	67.0	74.0	69.5	75.0	32.5	138.7
Jan. 27	561,566	475,292	1,610,642	1,469,936	72.7	79.0	45.2	93.0	67.0	74.0	69.5	75.1	34.4	137.8
Feb. 3	.....	.....	1,636,275	1,454,913	73.1	78.7	50.4	93.0	67.4	74.5	70.2		37.5	137.4

*Kilowatt hours, 000omitted.

Prices Current

Heavy Chemicals, Coaltar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Naval Stores, Fatty Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Imported chemicals are so designated. Resale stocks when a market factor are quoted in addition to makers' prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1933 Average $1.56 - Jan. 1933 $1.76 - Jan. 1934 $1.39

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Acetaldehyde, drs 1c-1 wks...lb.	....	.16	.16	.21	.18½ .21
drums, c-l, wks.....lb.	....	.14	.14	.16½	... ...
Acetaldol, 50 gal dr.....lb.	.27	.31	.27	.31	.27 .31
Acetamide.....lb.	.95	1.35	.95	1.35	.95 1.35
Acetanilid, tech, 150 lb bbl...lb.	....	.26	....	.26	... .26
Acetic Anhydride, 92-95%, 100 lb cbys.....lb.	.21	.25	.21	.25	.21 .25
Acetin, tech drums.....lb.	.30	.32	.30	.32	.30 .32
Acetone, tanks.....lb.	....	.10	....	.10	.08 .10
Acetone Oil, bbls NY.....gal.	1.15	.25	1.15	.25	1.15 1.25
Acetyl Chloride, 100 lb cby...lb.	.55	.68	.55	.68	.55 .68
Acetylene Tetrachloride (see tetrachlorethane).....					
Acids					
Acid Abietic.....	....	.06	....	.06	.06 .12
Acetic, 28% 400 lb bbls c-1 wks .....100 lb.	....	2.91	....	2.91	2.65 2.91
Glacial, bbl c-1 wk....100 lb.	....	10.02	....	10.02	9.14 10.02
Adipic.....	.72	.72	.72	.72	.72 .72
Anthranilic, refd, bbls.....lb.	.85	.95	.85	.95	.85 .95
Technical, bbls.....lb.	.65	.70	.65	.70	.65 .70
Battery, cbys.....100 lb.	1.60	2.25	1.60	2.25	1.60 2.25
Benzoic, tech, 100 lb bbls....lb.	.40	.45	.40	.45	.35 .45
Boric, powd, 250 lb. bbls. .....lb.	.0425	.05	.0425	.05	.0425 .05
Broenner's, bbls..lb.	1.20	1.25	1.20	1.25	1.20 1.25
Butyric, 100% basis cbys....lb.	.80	.85	.80	.85	.80 .85
Camphoric.....lb.	....	5.25	....	5.25	... 5.25
Chlorosulfonic, 1500 lb drums wks.....lb.	.04½	.05½	.04½	.05½	.04½ .05½
Chromic, 99½%, drs.....lb.	....	.13½	....	.13½	.11½ .14½
Chromotropic, 300 lb bbls....lb.	1.00	1.06	1.00	1.06	1.00 1.06
Citric, USP, crystals, 230 lb. bbls.....lb.	.28	.29	.28	.30	.29 .30
Cleve's, 250 lb bbls.....lb.	.52	.54	.52	.54	.52 .54
Cresylic, 95%, dark drs NY.gal.	....	.50	....	.50	.38 .50
97-99%, pale drs NY.....gal.	....	.55	....	.55	.40 .55
Formic, tech 90%, 140 lb. cby.....lb.	.11	.13	.11	.13	.10½ .13
Furoic, tech., 100 lb. drums.lb.	....	.35	....	.35	... .35
Gallic, tech, bbls.....lb.	.60	.70	.60	.70	.60 .70
USP, bbls.....lb.	....	.77	.74	.77	... .74
Gamma, 225 lb bbls wks.....lb.	.77	.79	.77	.79	.75 .79
H, 225 lb bbls wks.....lb.	.65	.70	.65	.70	.60 .70
Hydriodic, USP, 10% soln cby lb.	.50	.51	.50	.51	.50 .51
Hydrobromic, 48%, coml, 155 lb cbys wks.....lb.	.45	.48	.45	.48	.45 .48
Hydrochloric, CP, see Acid Muriatic.....					
Hydrocyanic, cylinders wks .lb.	.80	.90	.80	.90	.80 .90
Hydrofluoric, 30%, 400 lb bbls wks.....lb.	....	.07	....	.07	.06 .07
Hydrofluosilicic, 35%, 400 lb. bbls wks.....lb.	.11	.12	.11	.12	.11 .12
Hypophosphorous, 30%, USP, demijohns .....lb.	.75	.80	.75	.80	.75 .80
Lactic, 22%, dark, 500 lb bbls lb.	.04	.04½	.04	.04½	.04 .04½
44%, light, 500 lb bbls.....lb.	.11½	.12	.11½	.12	.11½ .12
Laurent's, 250 lb bbls.... ...lb.	.36	.37	.36	.37	.36 .37
Linoleic.....lb.	.16	.16	.16	.16	.16 .16
Maleic, cry. kegs.....lb.	....	.35	....	.35	... ...
Malic, powd, kegs.....lb.	.45	.60	.45	.60	.45 .60
Metanilic, 250 lb bbls.....lb	.60	.65	.60	.65	.60 .65
Mixed Sulfuric - Nitric.....					
tanks wks.....N unit	.06½	.07½	.06½	.07½	.06½ .07½
tanks wks.....S unit	.008	.01	.008	.01	.008 .01
Monochloroacetic, tech bbl...lb.	.16	.18	.16	.18	.16 .18
Monosulfonic, bbls.....lb.	1.50	1.60	1.50	1.60	1.50 1.60
Muriatic, 18 deg, 120 lb cbys c-1 wks.....100 lb.	....	1.35	....	1.35	... 1.35
tanks, wks.....100 lb.	....	1.00	....	1.00	... 1.00
20 degrees, cbys wks...100 lb.	....	1.45	....	1.45	... 1.45
N & W.....250 lb bbls	.85	.95	.85	.95	.85 .95
Naphthenic, drums .....lb.	.10	.11½	.10	.11½	.10 .11½
Naphthionic, tech .....250 lb.	.60	.65	.60	.65	.60 .65
Nitric, 36 deg, 135 lb cbys c-wks.....100 lb.	....	5.00	....	5.00	... 5.00
40 deg, 135 lb cbys, c-1 wks.....100 lb.	....	6.00	....	6.00	... 6.00
Oxalic, 300 lb bbls wks NY....lb.	.11⅜	.12⅜	.11⅜	.12⅜	.11 .12⅜
Phosphoric 50%, U. S. P.....lb.	....	.14	....	.14	... .14
Syrupy, USP, 70 lb drs....lb.	....	.14	....	.14	... .14
Picramic, 300 lb bbls.....lb.	.65	.70	.65	.70	.65 .70
Picric, kegs.....lb.	.30	.50	.30	.50	.30 .50
Pyrogallic, crystals..... .....lb.	1.40	1.45	1.40	1.45	1.40 1.45
Salicylic, tech, 125 lb bbl.....lb.	.33	.37	.33	.37	.33 .37
Sebacic, tech, drum.....lb.	.58	.58	.58	.58	.58 .58
Sulfanilic, 250 lb. bbls.....lb.	.18	.19	.18	.19	.15 .17
Sulfuric, 66 deg, 180 lb cbys					

†Anhydrous 5c higher. *Delivered metropolitan area, basic price 34c. §Higher price is refrigeration grade. a-New revenue tax adds $0.90 to the cost of tax paid ethyl alcohol. Quotation above includes this tax.

	Current Market	1934 Low	1934 High	1933 Low	1933 High
1c-1 wks.....100 lb.	1.60	1.95	1.60	1.95	1.60 1.95
tanks, wks, ton	....	15.00	....	15.00	.... 15.00
1500 lb dr wks.....100 lb.	1.50	1.65	1.50	1.65	1.50 1.65
60°, 1500 lb dr wks....100 lb.	1.27½	1.42½	1.27½	1.42½	1.27½ 1.42½
Oleum, 20%, 1500 lb. drs 1c-1 wks.....ton	....	18.50	....	18.50	.... 18.50
40%, 1c-1 wks net.....ton	....	42.00	....	42.00	.... 42.00
Tannic, tech, 300 lb bbls...lb.	.23	.40	.23	.40	.23 .40
Tartaric, USP, gran. powd, 300 lb bbls.....lb.	....	.25	....	.25	.20 .25
Tobias, 250 lb bbls.....lb.	.75	.80	.75	.80	.75 .80
Trichloroacetic bottles.....lb.	2.00	2.75	2.00	2.75	2.00 2.75
Kegs.....lb.	....	1.75	....	1.75	.... 1.75
Tungstic, bbls.....lb.	1.40	1.70	1.40	1.70	1.40 1.70
Albumen, blood, 225 lb bbls...lb.	.35	.43	.35	.43	.35 .43
dark.....bbls., lb.	.10	.17	.10	.17	.10 .17
Egg, edible .....lb.	.85	.90	.85	.90	.74 .90
Technical, 200 lb cases...lb.	.62	.66	.62	.66	.62 .66
Vegetable, edible.....lb.	.65	.70	.65	.70	.60 .70
Technical.....lb.	.50	.55	.50	.55	.50 .55
Alcohol Butyl, Normal, 50 gal drs c-1 wks.....lb.	....	10½	....	10½	.... 10½
Drums, 1-c-1 wks.....lb	....	11	....	11	 11
Tank cars wks.....lb.	....	09½	....	09½	.... 09½
Secondary tank .....lb.	....	.076	....	.076	....
drums carlots .....lb.	....	.086	....	.086	....
Amyl (from pentane) Tanks wks .....lb.	....	143	....	.143	.143 .176
Capryl, tech, drums.....lb.	....	.85	....	.85	.... .85
Diacetone, tanks.....lb.	15¼	16¼	.15¾	.16¼	.15¾ .16¼
Ethyl, USP, 190 pf, 50 gal. bbls.....gal.	4.12½	4.24½a	4.12½	4.24½	2.44½ 2.65
No. 5. *188 pf, 50 gal. drs. drums extra†.....gal.	....	351*	....	.351*	.... *.385
No. S. D. 1, tanks .....gal.	....	304	....	.304	.... .304
Furfuryl, tech., 500 lb. drs.lb.	....	40	....	.40	.40 .45
Isobutyl, ref., gal. drs.....gal.	....	75	....	.75	.... .75
Isopropyl, ref, gal drs.....gal.	....	50	....	.50	.45 .50
Propyl Normal, 50 gal dr..gal.	....	75	....	.75	.... .75
Aldehyde Ammonia, 100 gal drlb.	.80	.82	.80	.82	.80 .82
Aldol, 95%, l-cl dr.....lb.	....	.25	....	.25	....
c-l, dr.....lb.	....	.21	....	.21	....
Alpha-Naphthol, crude, 300 lb. bbls.....lb.	.65	.70	.65	.70	.65 .70
Alpha-Naphthylamine, 350 lb. bbls.....lb.	.32	.34	.32	.34	.32 .34
Alum Ammonia, lump, 400 lb bbls, 1-c-1 wks.....100 lb.	3.00	3.25	3.00	3.25	3.00 3.25
Chrome, 500 lb casks, wks .....100 lb.	7.00	7.25	6.50	7.25	4.50 6.50
Potash, lump, 400 lb casks wks.....100 lb.	3.00	3.50	3.00	3.50	3.00 3.50
Soda, ground, 400 lb bbls wks.....100 lb.	3.50	3.75	3.50	3.75	3.50 3.75
Aluminum Metal, c-1 NY.100 lb.	22.90	24.30	22.90	24.30	22.00 24.30
Chloride Anhyd., 99%, wks.lb.	.07	.12	.07	.12	....
93% grade, wks.....lb.	.04	.08	.04	.08	....
Hydrate, 96%, light, 90 lb. bbls.....lb.	.15	.16½	.15	.16½	.15 .16½
Palmitate, bbls.....lb	.19	.20	.19	.20	....
Resinate, pp., bbls.....lb.	12½	14	.12½	.14	....
Stearate, 100 lb bbls.....lb.	.17	.18	.17	.18	.12½ .18
Sulfate, Iron, free, bags c-1 wks.....100 lb.	1.90	1.95	1.90	1.95	1.90 1.95
Coml, bags c-1 wks .100 lb.	1.35	1.50	1.35	1.50	1.25 1.50
Aminoazobenzene, 110 lb kegs lb.	....	1.15	....	1.15	.... 1.15
Ammonia					
Ammonia anhydrous Com. tanks	.04½	05½§	.04½	05½§	.04½ .05½
Ammonia, anhyd. 100 lb cyl...lb.	15½	15½	.15½	.15¼	.15½ .15¼
Water, 26°, 800 lb dr del...lb.	.02½	03	.02½	.03	.02½ .03
Ammonia, aqua 26° tanks.... NH cont.....	....	05	....	.05	..... .05
Ammonium Acetate .....lb.	.26	.33	.26	.33	.26 .33
Bicarbonate, bbls., f.o.b. plant .....100 lb.	....	5.15	....	5.15	.... 5.15
Bifluoride, 300 lb bbls.....lb.	15½	.17	.15¼	.17	.15½ .17
Carbonate, tech, 500 lb cs..lb.	.08	.12	.08	.12	.08 .12
Chloride, white, 100 lb. bbls wks .....100 lb.	5.00	5.25	5.00	5.25	4.45 5.25
Gray, 250 lb bbls wks...lb.	5.25	5.75	5.25	5.75	5.25 5.75
Lump, 500 lb cks spot...lb.	.10	.11	.10	.11	.10 .11
Lactate, 500 lb bbls.....lb.	.15	.16	.15	.16	.15 .16
Linoleate.....lb.	....	.11	....	.11	.... .11
Nitrate, tech, casks.....lb.	.03¾	.05	.03¾	.05	.03¾ .10
Oleate, drs.....lb.	....	.10	....	.10	.... .10
Persulfate, 112 lb kegs.....lb.	.20	.22½	.20	.22½	.20 .22½
Phosphate, tech, powd, 325 lb. bbls.....lb.	.08½	.11½	.08½	.11½	.08½ .11½
Sulfate, bulk c-1.....100 lb.	....	1.25	....	1.25	1.00 1.25
Sulfocyanide, kegs.....lb.	....	.50	....	.50	.36 .50
Amyl Acetate, (from pentane) Tanks del.....lb	....	.13½	....	.13½	... 13½
Tech., drs del.....lb.	.142	.149	.142	.149	.138 .149

Amyl Acetate
Calcium Chloride

Prices

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Secondary, tanks lb.	....	.09	....	.09	....	.09
Amyl Alcohol, see also Fusel Oil.						
Amyl Alcohol, sec. lb.	....	.08½	.08½	.08½	....	....
Aniline Oil, 960 lb drs & tks. lb.	.15	.17½	.15	.17½	.14½	.16
Annatto, fine lb.	.34	.37	.34	.37	.34	.37
Anthracene, 80% lb.	....	.75	....	.75	....	....
40% lb.	....	.18	....	.18	....	....
Anthraquinone, sublimed, 125 lb. bbls lb.	....	.45	....	.45	...	.45
Antimony, metal slabs, ton lots lb.	....	.07¼	.07	.07¼	.05⅝	.07½
Needle, powd, bbls lb.	.08	.09	.08	.09	.07	.09
Chloride, soln (butter of) cbys lb.	.13	.17	.13	.17	.13	.17
Oxide, 500 lb bbls lb.	.08	.11	.08	.11	.07½	.11
Salt, 63% to 65%, tins lb.	.22	.24	.22	.24	.20	.24
Sulfuret, golden, bbls lb.	.16	.20	.16	.20	.16	.20
Vermillion, bbls lb.	.38	.42	.38	.42	.38	.42
Archil, conc, 600 lb bbls lb.	.21	.27	.21	.27	.20	.21
Double, 600 lb bbls lb.	.18	.20	.18	.20	.16	.17
Triple, 600 lb bbls lb.	.18	.20	.18	.20	.16	.17
Argols, 80%, casks lb.	.15	.16	.15	.16	.12	.15
Crude, 30%, casks lb.	.08	.09	.08	.09	.06¾	.09
Aroclors, wks lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbl lb.	.08½	.09¼	.08¾	.09¼	....	....
Arsenic, Red, 224 lb kegs, cs. lb.	.14	.14¾	.14	.14¾	.09¾	.14¾
White, 112 lb kegs lb.	.04	.05	.04	.05	.04	.05
Metal lb.	.44	.45	.44	.45	....	....
Asbestine, c-1 wks ton	13.00	15.00	13.00	15.00	13.00	15.00
Barium						
Barium Carbonate, precip, 200 lb. bags wks ton	56.50	61.00	56.50	61.00	56.50	61.00
Nat. (witherite) 90% gr. carlots wks bags ton	....	45.00	.....	45.00	.....	.....
Chlorate, 112 lb kegs NY lb.	.15	.16	.15	.16	.13¾	.16
Chloride, 600 lb bbl wks. ton	72.00	74.00	72.00	74.00	61.50	74.00
Dioxide, 88%, 690 lb drs. lb.	.11	.13	.11	.13	.11	.13
Hydrate, 500 lb bbls lb.	.04¾	.05	.04¾	.05	.04¼	.05
Nitrate, 700 lb casks lb.	....	.08½	.....	.08½	...	.07½
Barytes, Floated, 350 lb bbls wks ton	23.00	30.50	23.00	30.50	22.20	30.50
Bauxite, bulk, mines ton	5.00	6.00	5.00	6.00	5.00	6.00
Bayberry, bags lb.	.25	.30	.25	.30	.14½	.17
Beeswax, Yellow, crude bags. lb.	.16	.17	.16	.19	.13	.20
Refined, cases lb.	.22	.23	.22	.23	.18	.26
White, cases lb.	.32	.35	.32	.35	.30	.35
Benzaldehyde, technical, 945 lb. drums wks lb.	.60	.65	.60	.65	.60	.65
Benzene, 90%, Industrial, 8000 gal tanks wks gal.	....	.20½	.....	.20½	.20	.22
Ind. Pure, tanks works gal.	....	.20½	.....	.20½	.20	.22
Benzidine Base, dry, 250 lb. bbls lb.	.67	.69	.67	.69	.65	.67
Benzoyl, Chloride, 500 lb drs. lb.	.40	.45	.40	.45	.40	.45
Benzyl Chloride, tech drs lb.	....	.30	.....	.30	...	.30
Beta-Naphthol, 250 lb bbl wk lb.	....	.24	.....	.24	...	.24
Naphthylamine, sublimed, 200 lb bbls lb.	1.25	1.35	1.25	1.35	1.25	1.35
Tech, 200 lb bbls lb.	.53	.58	.53	.58	.53	.58
Bismuth, metal	....	1.30	....	1.30	85	1.30
Bismuth Subnitrate	....	1.40	....	1.40	.95	1.40
Blackstrap, cane, (see Molasses, Blackstrap)						
Blanc Fixe, 400 lb bbls wks. ton	42.50‡	70.00	42.50‡	70.00	42.50	75.00
Bleaching Powder, 800 lb drs c-1 wks contract 100 lb.	....	1.90	.....	1.90	1.75	1.90
Blood, Dried, fob, NY Unit	....	2.75	2.60	2.75	1.55	2.75
Chicago, high grade Unit	....	2.50	2.25	2.50	...	....
S. American shipt Unit	....	2.90	....	2.90	1.90	3.00
Blues, Bronze Chinese Milori Prussian Soluble lb.	.35½	.37½	.35½	.37½	...	.35
Bone, raw, Chicago ton	20.00	22.00	20.00	25.00	19.00	28.00
Bone Ash, 100 lb kegs lb.	.06	.07	.06	.07	.06	.07
Black, 200 lb bbls lb.	.05½	.08½	.05½	.08½	.05½	.08½
Meal, 3% & 50%, Imp. ton	16.00	18.00	16.00	18.00	18.00	27.50
Borax, bags lb.	.018	.02	.018	.02	.018	.02
Bordeaux, Mixture, 16% pwd. lb.	.10½	.14	.10½	.14	.11½	.13
Paste, bbls lb.	.10½	.14	.10½	.14	.10½	.13
Brazilwood, sticks, shpmt lb.	26.00	28.00	26.00	28.00	26.00	28.00
Bromine, cases lb.	.36	.43	.36	.43	.36	.43
Bronze, Aluminum, powd blk. lb.	.50	.75	.50	.75	.50	.75
Gold bulk lb.	.40	.55	.40	.55	.40	.55
Butanes, com 16.32° group 3 tanks lb.	.02¾	.04	.02¾	.04	.02¾	.04
Butyl, Acetate, normal drs. lb.	....	.11	.....	.11	.11	.139
Tank, wks. lb.	....	.10	.....	.10	.10	.124
Secondary tanks, wks lb.	....	.08	....	.08	....	....
Aldehyde, 50 gal drs wks. lb.	.35	.36	.35	.36	.31½	.36
Carbitol see Diethylene Glycol Mono (Butyl Ether)	....	....	.....	....	....	....
Cellosolve (see Ethylene glycol mono butyl ether)	....	....	.....	....	....	....
Furoate, tech. 50 gal. dr. lb.	....	.60	.....	.60	.50	.60
Lactate, drums lb.	....	.29	....	.29	....	....
Propionate, drs lb.	.20	.22	.20	.22	.20	.22
Stearate, 50 gal drs. lb.	.25	.25½	.25	.25½	.25	.25½
Tartrate, drs lb.	.55	.60	.55	.60	.55	.60
Cadmium, Sulfide, boxes lb.	.65	.75	.65	.75	.65	.75
Calcium, Acetate, 150 lb bags c-1 100 lb.	....	3.00	.....	3.00	2.50	3.00
Arsenate, 100 lb bbls c-1 wks lb.	....	.06¾	.06½	.07	.05½	.07
Carbide, drs lb.	.05	.06	.05	.06	.05	.06
Carbonate, tech, 100 lb bags c-1 lb.	1.00	1.00	1.00	1.00	1.00	1.00
Chloride, Flake, 375 lb drs c-1 wks ton	....	19.50	.....	19.50	19 50	21.00
Solid, 650 lb drs c-1 fob wks ton	....	17.50	.....	17.50	17.50	18.00
Ferrocyanide, 350 lb. bbls. f.o.b. wks lb.	....	.17	.....	.17	.17	.17

†F. O. B. destination, 1931 prices are works prices.
‡Lowest price is for pulp; highest for high-grade precipitate.

Current

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Calcium Furoate, tech, 100 lb. drums....lb.	....	.30	.....	.30	....	.30
Nitrate, 100 lb bags....ton	....	26.50	.....	26.50	24.00	26.50
Palmitate, bbls....lb.	.19	.20	.19	.20	.16	.19
Peroxide, 100 lb drs....lb.	....	1.25	.....	1.25	....	1.25
Phosphate, tech, 450 lb bbls.lb.	.07½	.08	.07½	.08	.07½	.08
Resinate, precip., bbls....lb.	.13	.14	.13	.14	....	....
Stearate, 100 lb. bbls....lb.	.17	.18	.17	.18	.12½	.18
Camphor, slabs....lb.	.55	.56	.55	.59	.35½	.59
Powder....lb.	.55	.56	.55	.59	.38	.59
Camwood, Bark, ground bbls.lb.	.16	.18	.16	.18	.16	.18
Candelilla Wax, bags....lb.	.11½	.12	.10¼	.12	.09	.11
Carbitol, (See Diethylene Glycol Mono Ethyl Ether).....	....	....	.....	.....	....	...
Carbon, Decolorizing, drums c-1....lb.	.08	.15	.08	.15	.08	.15
Black, 100-300 lb cases 1c-1 NY....lb.	.06½	.12	.06½	.12	.06	.12
Bisulfide, 500 lb drs 1c-1 NY....lb.	.05½	.06	.05½	.06	.05½	.06
Dioxide, Liq. 20-25 lb cyl..lb.	....	.06	.. ..	.06	....	.06
Tetrachloride, 1400 lb drs delivered....lb.	.05½	.06	.05½	.06	.05½	.07
Carnauba Wax, Flor, bags...lb.	.32	.33	.32	.33	.23	.33
No. 1 Yellow, bags....lb.	.30	.33	.30	.33	.20	.35
No. 2 N Country, bags....lb.	.20	.21	.20	.21	.14	.20
No. 3 N. C....lb.	.16½	.16½	.16½	.16½	.11½	.17
No. 3 Chalky....lb.	.16	.16½	.16	.16½	.12	.17
Casein, Standard, Domestic.... ground....lb	.12	.13	.12	.13	.06½	.15
80-100 mesh carlots, bags..lb.	.13½	.14	.13½	.14	....	....
Cellosolve (see Ethylene glycol mono ethyl ether).....						
Acetate (see Ethylene glycol mono ethyl ether acetate)..						
Celluloid, Scraps, Ivory cs....lb.	.13	.14	.13	.14	.13	.15
Shell, cases....lb.	.18	.20	.18	.20	.18	.20
Transparent, cases....lb.	....	.16	.....	.16	....	.16
Cellulose, Acetate, 50 lb kegs.lb.	.80	.90	.80	.90	.80	.90
Chalk, dropped, 175 lb bbls..lb.	.03	.03¾	.03	.03¾	.03	.03¾
Precip, heavy, 560 lb cks...lb.	.03	.04	.03	.04	.02	.03½
Light, 250 lb casks....lb.	.03	.04	.03	.04	.02½	.03½
Charcoal, Hardwood, lump, bulk wks....bu.	.18	.19	.18	.19	.18	.19
Willow, powd, 100 lb bbl. wks....lb.	.06	.06¼	.06	.06½	.06	.06¼
Wood, powd, 100 lb bbls...lb.	.04	.05	.04	.05	.04	.05
Chestnut, clarified bbls wks...lb.	.01⅝	.01¾	.01⅝	.01¾	.01¼	.02
25% tks wks....lb.	....	.01½	.....	.01½	.012	.01½
Powd, 60%, 100 lb bgs wks.lb.	....	.04¼	.....	.04¼	....	.04¼
Powd, decolorized bgs wks..lb.	.05	.05¼	.05	.05¼	.04¼	.05
China Clay, lump, blk mines..ton	8.00	9.00	8.00	9.00	8.00	9.00
Powdered, bbls....lb.	.01	.02	.01	.02	.01	.02
Pulverized, bbls wks....ton	10.00	12.00	10.00	12.00	10.00	12.00
Imported, lump, bulk....ton	15.00	25.00	15.00	25.00	15.00	25.00
Chlorine, cyls 1c-1 wks contract ....lb.	.07	.08½	.07	.08½	.07	.08½
cyls, el., contract....lb.	....	.05½†	.....	.05½†	....	.05½
Liq tank or multi-car lot cyls wks contract....100 lb.	....	1.85	.....	1.85	1.75	1.85
Chlorobenzene, Mono, 100 lb. drs 1c-1 wks....lb.	.06	.07½	.06	.07½	.06	.07½
Chloroform, tech, 1000 lb drs..lb.	....	.20	.....	.20	.15	.20
USP, tins....lb.	....	.30	.....	.30	....	....
Chloropicrin, comml cyls....lb.	.90	1.25	.90	1.25	.90	1.35
Chrome, Green, CP....lb.	.28	.29	.28	.29	.28	.29
Commercial....lb.	.06½	.10	.06½	.10	.06½	.10
Yellow....lb.	.15	.16	.15	.16	.14	.16
Chromium, Acetate, 8% Chrome bbls....lb.	.05	.05½	.05	.05½	.04¾	.05½
20° soln, 400 lb bbls....lb.	....	.05½	.....	.05½	....	.05½
Fluoride, powd, 400 lb bbl..lb.	.27	.28	.27	.28	.27	.28
Oxide, green, bbls....lb.	.22	.23	.22	.23	.19	.23
Coal tar, bbls....bbl.	8.50	9.00	8.50	9.00	.50	9.00
Cobalt Acetate, bbls....lb.	.75	.80	.75	.80	....	....
Carbonate tech., bbls....lb.	1.34	1.40	1.34	1.40	....	....
Hydrate, bbls....lb.	1.66	1.76	1.66	1.76	....	....
Linoleate, paste, bbls....lb.	.39	.40	.39	.40	....	....
Resinate, fused, bbls....lb.	....	.12½	.....	.12½	....	....
Precipitated, bbls....lb.	.41	.42	.41	.42	.41	.42
Cobalt Oxide, black, bags....lb.	1.25	1.35	1.25	1.35	1.15	1.35
Cochineal, gray or black bag..lb.	.36	.42	.36	.42	.36	.42
Teneriffe silver, bags....lb.	.37	.43	.37	.43	.37	.43
Copper, metal, electrol...100 lb.	....	8.25	8.00	8.25	5.00	9.00
Carbonate, 400 lb bbls....lb.	....	.08¼	.....	.08¼	.07	.08
52-54% bbls....lb.	....	.16¼	.....	.16¼	.15¾	.17¼
Chloride, 250 lb bbls....lb.	.17	.18	.17	.18	.17	.18
Cyanide, 100 lb drs....lb.	.39	.40	.39	.40	.39	.40
Oleate, precip., bbls....lb.	....	.20	.....	.20	....	....
Oxide, red, 100 lb bbls....lb.	.12½	.17	.12½	.17	.14¾	.15
Resinate, precip., bbls....lb.	.18	.19	.18	.19	....	....
Stearate, precip., bbls....lb.	.35	.40	.35	.40	....	....
Sub-acetate verdigris, 400 lb bbls....lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls c-1 wks....100 lb.	....	3.75	.....	3.75	3.00	3.75
Copperas, crys and sugar bulk c-1 wks bags....ton	14.00	14.50	14.00	14.50	14.00	14.50
Corn Syrup, 42 deg., bbls. 100 lb.	....	3.04	.....	3.04	2.61	3.04
43 deg., bbls....100 lb.	....	3.09	.....	3.09	2.66	3.09
Cotton, Soluble, wet, 100 lb bbls....lb.	.40	.42	.40	.42	.40	.42
Cottonseed, S. E. bulk c-1...ton		*(See Oils and Fats News Section)*				
7% Amm., bags mills...ton	13.25	38.00	13.25	38.00	13.25	38.00
Cream Tartar, USP, 300 lb. bbls....lb.	.17½	.17¾	.17½	.17¾	.14½	.17¾
Creosote, USP, 42 lb cbys....lb.	.45	.47	.45	.47	.40	.47
Oil, Grade 1 tanks....gal.	.11	.12	.11	.12	.11	.12
Grade 2....gal.	.10	.12	.10	.12	.10	.12
Grade 3....gal.	.09	.12	.09	.12	.09	.12
Cresol, USP, drums....lb.	....	.11	.....	.11	.10½	.11
Crotonaldehyde, 98% 50 gal dr.lb.*	.26	.30	.26	.30	.32	.36

†Delivered. *Lower price is for carlots.

Cudbear Fusel Oil — Prices

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Cudbear, English lb.	.19	.25	.19	.25	.16	.25
Cutch, Rangoon, 100 lb bales lb.	....	.02¾	.....	.02¾	.02½	.03
Borneo, Solid, 100 lb bale lb.	....	.04½	.....	.04½	.02½	.04½
Philippine, 100 lb. bale lb.	.03½	.04½	.03½	.04½	....	....
Cyanamide, bags c-l frt allowed Ammonia unit	....	1.07½	.....	1.07½	.97½	1.07½
Dextrin, corn, 140 lb bags 100 lb.	3.62	3.82	3.62	3.82	2.89	3.84
British Gum, bags 100 lb.	3.87	4.07	3.87	4.07	3.89	3.92
White, 140 lb bags 100 lb	3.47	3.67	3.47	3.67	2.94	3.79
Potato Yellow, 220 lb bgs. lb.	.07¾	.08¾	.07¾	.08¾	.07¾	.09
White, 220 lb bags lc-l lb.	.08	.09	.08	.09	.08	.09
Tapioca, 200 lb bags lc-l lb.	.06¾	.07¾	.06¾	.07¾	.06¾	.08
Diamylether, wks., drums lb.	.60	.77	.60	.77	....	....
Diamylphthalate, drs wks gal.	....	.20½	....	.20½	....	....
Dianisidine, barrels lb.	2.35	2.45	2.35	2.45	2.35	2.70
Dibutylphthalate, wks lb.	.20½	.21	.20½	.21	.20½	.22
Dibutyltartrate, 50 gal drs lb.	.29½	.31½	.29½	.31½	.29½	.21
Dichlorethylene, drums gal.	.29	....	.29	....	....	....
Dichloroethylether, 50 gal drs lb.	....	.21	.....	.21	.16	.21
Dichloromethane, drs wks lb.	....	.15	....	.15	....	....
Diethylamine, 400 lb drs lb.	2.75	3.00	2.75	3.00	2.75	3.00
Diethylcarbonate, com. drs. lb.	....	.35	.....	.35	....	....
90% grade, drs. lb.	....	.25	.....	.25	....	....
Diethylaniline, 850 lb drs lb.	.52	.55	.52	.55	.52	.55
Diethyleneglycol, drs lb.	.14	.16	.14	.16	.14	.16
Mono ethyl ether, drs lb.	.15	.16	.15	.16	.15	.16
Mono butyl ether, drs lb.	....	.26	.....	.26	....	.26
Diethylene oxide, 50 gal drs. lb.	.26	.27	.26	.27	.26	.27
Diethylorthotoluidin, drs lb.	.64	.67	.64	.67	.64	.67
Diethyl phthalate, 1000 lb. drums lb.	.26	.27	.26	.27	.20	.26
Diethylsulfate, technical, 50 gal drums lb.	....	....	...	...	....	....
Digtycol Oleate, bbls lb.	....	.16	.....	.16	....	....
Dimethylamine, 400 lb drs, pure 25 & 40% sol. 100% basis lb.	....	1.20	.....	1.20	....	....
Dimethylaniline, 340 lb drs lb.	.29	.30	.29	.30	.25	.28
Dimethyl phthalate drs lb.	....	.24½	.....	.24½	....	....
Dimethylsulfate, 100 lb drs. lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls. lb.	.17	.19½z	.17	.19½z	....	.18
Dintrochlorobenzene, 400 lb bbls lb.	.14½	.15½	.14½	.15½	.13	.15
Dinitronaphthalene, 350 lb bbls lb.	.34	.37	.34	.37	.34	.37
Dinitrophenol, 350 lb bbls lb.	.23	.24	.23	.24	.23	.24
Dinitrotoluene, 300 lb bbls lb.	.15½	.16½	.15½	.16½	.15	.17
Dioxan (See Diethylene Oxide)	....	....	.....	....	....	....
Diphenyl lb.	.15	.25	.15	.25	.15	.40
Diphenylamine lb.	.31	.34	.31	.34	.31	.34
Diphenylguanidine, 100 lb bbl lb.	.36	.37	.36	.37	.30	.37
Dip Oil, 25%, drums lb.	.23	.25	.23	.25	.23	.25
Divi Divi pods, bgs shipmt ton	....	36.00	.....	36.00	26.00	36.00
Extract lb.	.05	.05½	.05	.05½	.05	.05½
Egg Yolk, 200 lb cases lb.	....	.42	.40	.43	.40	.43
Epsom Salt, tech, 300 lb bbls c-1 NY 100 lb.	....	2.20	.....	2.20	....	2.20
Ether, USP anaesthesia 55 lb. drs. lb.	....	.24	.....	.24	.22	.24
(Cone) lb.	.09	.10	.09	.10	.09	.10
Isopropyl 50 gal. drums lb.	.07‡x	.08	.07‡x	.08	.07	.08
Synthetic, wks, drums lb.	.08	.09	.08	.09	....	....
Ethyl Acetate, 85% Ester tanks lb.	.07½	.08	.07½	.08	.07½	.09
drums lb.	.08½	.09	.08½	.09	.08½	.10
Anhydrous, tanks lb.	.09	.10	.09	.10	.09	.10
drums lb.	.10	.10¼	.10	.10¼	.10	.10¼
Acetoacetate, 50 gal drs. lb.	.65	.68	.65	.68	.65	.68
Benzylaniline, 300 lb drs. lb.	.88	.90	.88	.90	.88	.90
Bromide, tech, drums lb.	.50	.55	.50	.55	.50	.55
Chloride, 200 lb drums lb.	....	.24	.....	.24	.22	.24
Chlorocarbonate cbys lb.	....	.30	.....	.30	....	.30
Crotonate, drums lb.	1.00	1.25	1.00	1.25	....	....
Ether, Absolute, 50 gal drs. lb.	.50	.52	.50	.52	.50	.52
Furoate, 1 lb tins lb.	....	1.00	.....	1.00	1.00	5.00
Lactate, drums works lb.	.25	.29	.25	.29	.25	.29
Methyl Ketone, 50 gal drs. lb.	....	.12½	.....	.12½	....	.12½
Oxalate, drums works lb.	.37½	.55	.37½	.55	.37½	.55
Oxybutyrate, 50 gal drs wks lb.	.30	.30½	.30	.30½	.30	.30½
Ethylene Dibromide, 60 lb dr. lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys. chloro, cont lb.	.75	.85	75	.85	.75	.85
Dichloride, 50 gal drums lb.	.05½	.06½	.05½	.06½	.05	.09
Glycol, 50 gal drs wks lb.	.26	.28	.26	.28	.25	.28
Mono Butyl Ether drs wks.	....	.20	.....	.20	....	.20
Mono Ethyl Ether drs wks	.15	.17	.15	.17	.15	.17
Mono Ethyl Ether Acetate dr. wks	.16½	.18	.16½	.18	.16½	.18
Mono Methyl Ether, drs. lb.	.21	.23	.21	.23	.21	.23
Stearate	.18	.18	.18	.18	.18	.18
Oxide, cyl lb.	....	.75	.....	.75	....	.75
Ethylidenaniline lb.	.45	.47½	.45	.47½	.45	.47½
Feldspar, bulk pottery ton	....	14.50	.....	14.50	14.00	16.50
Powdered, bulk works ton	13.50	14.50	13.50	14.50	13.50	14.50
Ferric Chloride, tech, crystal 475 lb bbls lb.	.05	.07½	.05	.07½	.04½	.07½
Fish Scrap, dried, wks unit	....	2.50*	.....	2.50*	1.85	2.75*
Acid, Bulk 7 & 3½% delivered Norfolk & Balt. basis unit	....	2.50†	.....	2.50†	1.85	2.50†
Fluorspar, 98%, bags	28.00	35.50	28.00	35.50	28.00	35.50
Formaldehyde, aniline, 100 lb. drums lb.	.37½	.42	.37½	.42	.37½	.42
USP, 400 lb bbls wks lb.	.06	.07	.06	.07	.06	.07
Fossil Flour lb.	.02½	.04	.02½	.04	.02½	.04
Fullers Earth, bulk, mines ton	15.00	20.00	15.00	20.00	15.00	20.00
Imp. powd c-1 bags ton	24.00	30.00	24.00	30.00	24.00	30.00
Furfural (tech.) drums wks, lb.	.10§	.15	.10§	.15	.10	.15
Furfuramide (tech) 100 lb dr. lb.	....	.30	.....	.30	....	.30
Furfuryl Acetate, 1 lb tins lb.	....	5.00	.....	5.00	....	5.00
Fusel Oil, 10% impurities lb.	.16	.18	.16	.18	.14½	.18

*& 10; †& 50 xTanks 2c lower.

‡Higher price, refined. §Tanks, 1c lower zHigher price is for purified.

Current

	Current Market		1934 Low	1934 High	1933 Low	1933 High
Fustic, chips lb.	.04	.05	.04	.05	.04	.05
Crystals, 100 lb boxes lb.	.20	.23	.20	.23	.18	.23
Liquid 50°, 600 lb bbls lb.	.08½	.12	.08½	.12	.07	.10
Solid, 50 lb boxes lb.	.16	.18	.16	.18	.14	.18
Sticks ton	25.00	26.00	25.00	26.00	25.00	26.00
G Salt paste, 360 lb bbls lb.	.42	.43	.42	.43	.42	.43
Gall Extract lb.	.18	.20	.18	.20	.18	.20
Gambier, common 200 lb cs lb.	.04	.05½	.04	.05½	.03	.07
Singapore cubes, 150 lb bg lb.	.06	.07	.06	.07	.05¼	.08
Gelatin, tech, 100 lb cases lb.	.45	.50	.45	.50	.45	.50
Glauber's Salt, tech, c-l wks. 100 lb.	1.10	1.30	1.10	1.30	1.00	1.70
Glucose (grape sugar) dry 70-80° bags c-l NY 100 lb.	3.24	3.34	3.24	3.34	3.24	3.34
Tanner's Special, 100 lb bags 100 lb.	....	2.33	.....	2.33	....	2.33
Glue, medium white, bbls lb.	.13½	.19	.13½	.19	.12	.23
Pure white, bbls lb.	.23	.28	.23	.28	.18	.28
Glycerin, CP, 550 lb drs lb.	....	.11	.....	.11	.10¼	.11
Dynamite, 100 lb drs lb.	....	.10½	.10	.10½	.07½	.10½
Saponification, tanks lb.	.06¾	.07	.06¾	.07	.05	.08
Soap Lye, tanks lb.	....	.06¼	.06¼	.06½	.04	.06½
Glyceryl Stearate, bbls lb.	....	.18	.....	.18	.17	.18
Graphite,						
Crystalline, 500 lb. bbls lb.	.04	.05	.04	.05	.04	.05
Flake, 500 lb bbls lb.	.08	.16	.08	.16	.08	.16
Amorphous bbls lb.	.03	.04	.03	.04	.03	.04
Gums						
Gum Accroides, Red, coarse and fine 140-150 lb bags lb.	.03¾	.04½	.03¾	.04½	.03¾	.04½
Powd, 150 lb bags lb.	.06	.06½	.06	.06½	.06	.06½
Yellow, 150-200 lb bags lb.	.18	.20	.18	.20	.18	.20
Aloes, Barbadoes lb.	.85	.90	.85	.90	.85	.90
Animi (Zanzibar) bean & pea 250 lb cases lb.	.35	.40	.35	.40	.35	.40
Glassy, 250 lb cases lb.	.50	.55	.50	.55	.50	.55
Arabic, amber sorts lb.	....	.08½	.08	.08½	.05¾	.08¼
Asphaltum, Barbadoes (Manjak) 200 lb bags lb.	.03	.06	.03	.06	.03	.05
Egyptian, 200 lb cases lb.	.13	.15	.13	.15	.13	.15
Ester, light lb.	....	.06	.....	.06	....	....
Dark lb.	....	.05¼	....	.05¼	....	....
Gamboge, pipe, cases lb.	.57	.60	.57	.60	.42	.65
Powdered, bbls lb.	.67	.70	.67	.70	.50	.70
Gilsonite Selecta, 200 lb bags ton	30.50	32.90	30.50	32.90	30.50	32.90
Damar Batavia standard 136, lb. cases lb.	.13	.13½	.13	.13½	.08½	.15½
Batavia Dust, 160 lb bags lb.	.06¼	.07	.06¼	.07	.04	.07½
E Seeds, 136 lb cases lb.	.08	.09	.08	.09	.05½	.09½
F Splinters, 136 lb cases and bags lb.	.05½	.06	.05½	.06	.05½	.06
Singapore, No. 1, 224 lb cases lb.	.17½	.18	.17½	.18	.09½	.18
No. 2, 224 lb cases lb.	.10½	.11	.10½	.11	.07	.11½
No. 3, 180 lb bags lb.	.06½	.07	.06½	.07	.04½	.07½
Benzoin Sumatra, U. S. P. 120 lb. cases lb.	.21	.23	.21	.23	.17	.23
Copal Congo, 112 lb bags, clean opaque lb.	.27½	.28	.27½	.28	.16½	.28
Dark, amber lb.	.09¾	.10½	.09¾	.10½	.06	.10½
Light, amber lb.	.15	.19	.15	.19	.08	.19
Water, white lb.	.47	.48	.47	.48	.37	.48
Kino, tins lb.	.75	.80	.75	.80	....	....
Mastic lb.	.37¼	.40	.37¼	.40	.26⅞	.40
Manila 180-190 lb baskets						
Loba A lb.	.13¾	.14½	.13¾	.14½	.09	.13½
Loba B lb.	.12¾	.13½	.12¾	.13½	.08	.13
Loba C lb.	.11	.11½	.11	.11½	.07	.12
M A Sorts lb.	.06½	.07	.06½	.07	.05	.07
D B B Chips lb.	.08½	.09	.08½	.09	.05¾	.09½
East Indies chips, 180 lb bags lb.	.04½	.05	.04½	.05	.04	.07
Pale bold, 224 lb cs lb.	.16	.17	.16	.17	.05½	.17
Pale nubs, 180 lb bags lb.	.11	.13	.11	.13	.05	.13
Pontianak, 224 lb cases						
Bold gen No. 1 lb.	.17½	.18½	.17½	.18½	.14	.18½
Gen. chips spot lb.	.07¼	.08	.07¼	.08	.05	.08
Elemi, No. 1, 80-85 lb cs lb.	.11	.11½	.11	.11½	.09	.12½
No. 2, 80-85 lb cases lb.	.10¾	.11½	.10¾	.11½	.08½	.12
No. 3, 80-85 lb cases lb.	.08	.08½	.08	.08½	.08	.08½
Ghatti, sol. bags lb.	.09	.09½	.09	.09½	.06	.09½
Karaya, pow. bbls xxx lb.	.23	.25	.23	.25	....	....
xx lb.	.15	.16	.15	.16	....	....
No. 1 lb.	.10	.11	.10	.11	....	....
No. 2 lb.	.08	.09	.08	.09	....	....
Kauri, 224-226 lb cases No. 1 lb.	.20	.25	.20	.25	.20	.25
No. 2 fair pale lb.	.12½	.16	.12½	.16	.12½	.16
Brown Chips, 224-226 lb. cases lb.	.06½	.08½	.06½	.08½	.06½	.12
Bush Chips, 224-226 lb. cases lb.	.22	.24	.22	.24	.22	.24
Pale Chips, 224-226 lb cases lb.	.11	.14	.11	.14	.11	.14
Sandarac, prime quality, 200 lb. bags & 300 lb. casks lb.	.48	.50	.48	.50	.21	.50
Senegal, picked bags lb.	.17	.18	.17	.18	....	....
Sorts lb.	.08	.08½	.08	.08½	....	....
Thus, bbls 280 lbs.	....	9.50	.....	9.50	....	....
Strained 280 lbs.	....	9.50	.....	9.50	....	....
Tragacanth, No. 1 bags lb.	....	1.00	.....	1.00	.65	1.00
Yacca, bags lb.	....	.04	.....	.04	....	....
Hematine crystals, 400 lb bbls lb.	.16	.18	.16	.18	.10	.18
Paste, 500 bbls lb.	....	.11	.....	.11	....	.11
Hemlock 25%, 600 lb bbls wks lb.	.03½	.04½	.03½	.04½	.03½	.04½
Bark ton	....	16.00	.....	16.00	....	16.00
Hexalene, 50 gal drs wks lb.	....	.30	.....	.30	....	.30
Hexane, normal 60-70° C. Group 3, tanks gal.	....	.14	.....	.14	....	....
Hexamethylenetetramine, drs lb.	.37	.39	.37	.39	....	....
Hoof Meal, f.o.b. Chicago unit	1.85	1.90	1.85	1.90	.75	1.75
South Amer. to arrive unit	1.65	1.75	1.65	1.75	1.40	1.75
Hydrogen Peroxide, 100 vol, 140 lb cbys lb.	.20	.21	.20	.21	.20	.21

Hydroxyamine Hydro. Myrobalans — *Prices*

		Current Market	1934 Low	1934 High	1933 Low	1933 High
Hydroxyamine Hydrochloride	lb.	....	3.15	.....	3.15	....	3.15
Hypernic, 51°, 600 lb bbls.	lb.	.17	.20	.17	.20	.11	.20
Indigo Madras, bbls.	lb.	1.25	1.30	1.25	1.30	1.25	1.30
20% paste, drums	lb.	.15	.18	.15	.18	.15	.18
Synthetic, liquid	lb.	....	.12	.....	.12	....	.12
Iodine, crude	per kilo	....	15s 1d	.....	15s 1d	....	....
Resublimed, kegs	lb.	2.25	2.30	2.25	2.30	2.10	3.40
Irish Moss, ord. bales	lb.	.07	.08	.07	.08	....	....
Bleached, prime, bales	lb.	.14	.15	.14	.15	....	....
Iron Acetate Liq. 17°, bbls.	lb.‡	.03	.04	.03	.04	....	....
Iron Chloride see Ferric or Ferrous							
Nitrate, kegs	lb.	.09	.10	.09	.10	.09	.10
Coml, bbls	100 lb.	2.75	3.25	2.75	3.25	2.50	3.25
Oxide, English	lb.	.04½	.07	.04½	.07	.04	.07
Isopropyl Acetate, tanks	lb.	....	.07	.07	.07	....	....
Japan Wax, 224 lb cases	lb.	.06	.06¼	.06	.08	.05½	.08
Keiselguhr, 95 lb bgs NY							
Brown	ton	60.00	70.00	60.00	70.00	60.00	70.00
Lead Acetate, bbls wks	100 lb.	....	9.50	.....	9.50	8.50	9.50
White crystals, 500 lb bbls wks	100 lb.	....	10.50	.....	10.50	9.50	10.50
Arsenate, drs 1c-1 wks	lb.	.10	.18	.10	.18	.09	.10½
Dithiofuroate, 100 lb dr.	lb.	....	1.00	.....	1.00	....	1.00
Linoleate, solid bbls	lb.	.26	.26½	.26	.26½	....	....
Metal, c-1 NY	100 lb.	....	4.00	4.00	4.15	3.00	4.50
Nitrate, 500 lb bbls wks	lb.	.10	.14	.10	.14	.10	.14
Oleate, bbls	lb.	.15	.16	.15	.16	.15	.16
Lead Oxide Litharge, 500 lb bbls	lb.	....	.06¾	.....	.06¾	.05½	.07
Red, 500 lb bbls wks	lb.	....	.07¾	.....	.07¾	.06½	.08
Resinate, precip., bbls	lb.	.18	.18½	.18	.18½	....	....
Stearate, bbls	lb.	.22	.23	.22	.23	....	....
White, 500 lb bbls wks	lb.	.06½	.07	.06½	.07	.06	.07
Sulfate, 500 lb bbls wk	lb.	....	.06	.....	.06	.05½	.06
Lime, ground stone bags	ton	....	4.50	.....	4.50	....	4.50
Live, 325 lb bbls wks	bbl.	....	1.70	.....	1.70	....	....
Lime Salts, see Calcium Salts							
Lime-Sulfur soln bbls	gal.	.14	.33	.14	.33	.15	.17
Linseed cake, bulk	ton	....	27.00	24.50	27.00	17.50	27.50
Linseed Meal	ton	....	37.00	.....	37.00	28.00	37.00
Lithopone, 400 lb bbls 1c-1 wks	lb.	.04¾	.05	.04¾	.05	.04¾	.05
Logwood, 51°, 600 lb bbls.	lb.	.08½	.12½	.08½	.12½	.05	.12½
Solid, 50 lb boxes	lb.	.14½	.17½	.14½	.17½	.08	.17½
Sticks	ton	24.00	26.00	24.00	26.00	24.00	26.00
Madder, Dutch	lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbl.	ton	55.00	60.00	55.00	60.00	46.00	65.00
Magnesium Carb, tech, 70 lb bags NY	lb.	....	.06½	.....	.06½	.05¾	.06½
Chloride flake, 375 lb. drs c-1 wks	ton	34.00	36.00	34.00	36.00	34.00	36.00
Imported shipment	ton	31.75	33.00	31.75	33.00	31.75	33.00
Fused, imp., 900 lb bbls NY	ton	....	31.00	.....	31.00	....	31.00
Fluosilicate, crys, 400 lb bbls. wks	lb.	.10	.10½	.10	.10½	.10	.10½
Oxide, USP, light, 100 lb bbls.	lb.	....	.42	.....	.42	....	.42
Heavy, 250 lb bbls	lb.	....	.50	.....	.50	....	.50
Palmitate, bbls	lb.	.21	.22	.21	.22	....	....
Peroxide, 100 lb cs	lb.	1.20	1.25	1.20	1.25	1.00	1.25
Silicofluoride, bbls	lb.	.10	.11	.10	.11	.08½	.11
Stearate, bbls	lb.	.19	.20	.19	.20	.16½	.20
Manganese Borate, 30%, 200 lb. bbls	lb.	.15	.16	.15	.16	.15	.16
Chloride, 600 lb casks	lb.	.07	.08	.07	.08	.07	.08
Dioxide, tech (peroxide) drs	lb.	.03¾	.06	.03¾	.06	.03½	.06
Linoleate, lig. drums	lb.	.18	.19	.18	.19	....	....
Resinate, fused, bbls	lb.	.08½	.08½	.08½	.08½	....	....
precip., bbls	lb.	.11½	.12½	.11½	.12½	....	....
Sulfate, 550 lb drs NY	lb.	....	.08	.....	.08	.07	.08
Mangrove 55%, 400 lb bbls.	lb.	....	.04	.....	.04	....	.04
Bark, African	ton	29.00	30.00	29.00	31.00	22.00	31.00
Marble Flour, bulk	ton	12.00	13.00	12.00	13.00	12.00	13.00
Mercuric chloride	lb.	.82	.87	.82	.87	.67	.87
Mercury metal	76 lb flask	....	68.00	66.50	69.00	48.00	69.00
Meta-nitro-aniline	lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-para-toluidine 200 lb. bbls	lb.	1.40	1.55	1.40	1.55	1.40	1.55
Meta-phenylene-diamine 300 lb. bbls	lb.	.80	.84	.80	.84	.80	.84
Meta-toluene-diamine, 300 lb. bbls	lb.	.67	.69	.67	.69	.67	.69
Methanol, (Wood Alcohol)							
*Crude, tanks	gal.	....	.25	.....	.25	.20	.20
95% tanks	gal.	.33	.35	.33	.35	.33	.35
97% tanks	gal.	.34	.39	.34	.39	.34	.39
*Pure, Synthetic drums cars	gal.	....	.40	.....	.40	.37½	.40
*Synthetic tanks	gal.	....	.35½	.....	.35½	....	.35½
*Denat. grade, tanks	gal.	....	.40	.....	.40	.35	.40
Methyl Acetate drums 82%	gal.	.12	.13	12	.13	.12	.13
99% tanks	gal.	....	.15	.....	.15	....	.15
Acetone, drums	gal.	.54½	.57	.54½	.57	.42	.57
Hexyl Ketone, pure	lb.	....	1.20	.....	1.20	....	1.20
Anthraquinone	lb.	.65	.67	.65	.67	.65	.67
Butyl Ketone, tanks	lb	....	.10½	.10½	.10½	....	....
Cellosolve, (See Ethylene Glycol Mono Methyl Ether)		....	....	.....	....	....	....
Chloride, 90 lb cyl.	lb.	.45	.45	.45	.45	.45	.48
Ethyl Ketone, tanks	lb.	....	.07½	.07½	.07½	....	....
Mica, dry grd. bags wks	lb.	65.00	80.00	65.00	80.00	65.00	80.00
Michler's Ketone, kegs	lb.	....	2.50	.....	2.50	2.50	3.00
Molasses, blackstrap, tanks f.o.b. N. Y.	gal.	.08½	.09	.06½	.09	.04½	.07
Monochlorobenzene, drums, see Chlorobenzene, mono	lb.						
Monomethylparaminosulfate 100 lb drums	lb.	3.75	4.00	3.75	4.00	3.75	4.00
Montan Wax, crude, bags	lb.	....	.10	.....	.10	.03¾	.10
Myrobalans 20%, liq bbls	lb.	.03¾	.04½	.03¾	.04½	.03¼	.04½
50% Solid, 50 lb boxes	lb.	.06	.06½	.06	.06¾	.05	.06¾

*delivered basis (east of Miss. River) †As of Sept. 1, $2.56.
‡Higher price is for lcl quantities.

Current

Myrobalans
Phenyl-Alpha-Naphthylamine

	Current Market	1934 Low	1934 High	1933 Low	1933 High
J1 bags.....ton	....	32.00	.....	32.00	27.00	35.00
J2 bags.....ton	17.50	18.50	17.50	18.50	15.50	22.75
R2 bags.....ton	17.00	18.00	17.00	18.00	15.00	22.00
Naphtha, v.m.& p. (deodorized) tanks, Group 3 tanks...gal.	.06⅛	.07⅛	.06⅛	.07⅛	....	....
Bayonne, tanks.....lb.	....	.09½	.....	.09½	.08½	.09½
Naphthalene balls, 250 lb bbls wks.....lb.	.06	.07	.06	.07	.05½	.07
Crude, imp.....100 lb.	....	2.15	.....	2.15	1.75	2.15
Crushed, chipped bgs wks...lb.	....	.05	.....	.05	....	.05
Flakes, 175 lb bbls wks.....lb.	....	.07¼	.....	.07¼	....	.07¼
Nickel Chloride, bbls.....lb.	.18	.19	.18	.19	.17	.19
Oxide, 100 lb kegs NY.....lb.	.35	.37	.35	.37	.35	.37
Salt bbl. 400 bbls lb NY...lb.	.11½	.12	.11½	.12	.11	.13
Single, 400 lb bbls NY.....lb.	.11½	.12	.11½	.12	.11	.12
Metal ingot.....lb.	.35	.35	.35	.35	.35	.35
Nicotine, free 40%, 8 lb tins, cases.....lb.	8.25	10.15	8.25	10.15	....	....
Sulfate, 55 lb. drums.....lb.	.67	.75	.67	.75	.67	.75
Nitre Cake, bulk.....ton	12.00	14.00	12.00	14.00	10.00	14.00
Nitrobenzene, redistilled, 1000 lb drs wks*.....lb.	.08½	.11	.08½	.11	.08½	.11
Nitrocellulose, c-l-l-cl, wks....lb.	.27	.33	.27	.33	.27	.33
Nitrogenous Material, bulk unit	....	2.60	2.40	2.60	1.50	3.50
Nitronaphthalene, 550 lb bbls.lb.	.24	.25	.24	.25	.24	.25
Nutgalls Aleppy, bags.....lb.	....	.18	.....	.18	....	.18
Chinese, bags.....lb.	.17	.18	.17	.18	.17	.18
Oak Bark, ground.....ton	30.00	35.00	30.00	35.00	30.00	35.00
Whole.....ton	20.00	23.00	20.00	23.00	20.00	23.00
Extract, 25% tannin, bbls..lb.	.03⅜	.03½	.03⅜	.03½	....	....
Orange-Mineral, 1100 lb casks NY.....lb.	....	.10½	.....	.10½	09½	.10¼
Orthoaminophenol, 50 lb kgs..lb.	2.15	2.25	2.15	2.25	2.15	2.25
Orthoanisidine, 100 lb drs....lb.	1.00	1.15	1.00	1.15	1.00	1.15
Orthochlorophenol, drums....lb.	.50	.65	.50	.65	.50	.65
Orthocresol, drums.....lb.	.13	.15	.13	.15	.13	.15
Orthodichlorobenzene, 1000 lb. drums.....lb.	.05½	.06	.05½	.06	.05½	.06
Orthonitrochlorobenzene, 1200 lb drs wks.....lb.	.28	.29	.28	.29	.28	.29
Orthonitrotoluene, 1000 lb drs wk.....lb.	.05½	.06	.05½	.06	.05½	.06
Orthonitrophenol, 350 lb dr...lb.	.52	.80	.52	.80	.52	.90
Orthotoluidine, 350 lb bbl lc-l lb.	.14	.15	.14	.15	.14	.22
Orthonitroparachlorphenol, tins .....lb.	.70	.75	.70	.75	.70	.75
Osage Orange, crystals.....lb.	.16	.17	.16	.17	.16	.17
51 deg. liquid.....lb.	.07	.07¾	.07	.07¾	.06	.07¾
Powdered, 100 lb bags.....lb.	.14½	.15	.14½	.15	.14½	.15
Paraffin, refd, 200 lb cs slabs 123-127 deg. M. P.....lb.	.04½	.04½	.04½	.04½	.02	.04½
128-132 deg. M. P.....lb.	....	.04½	.....	.04½	.03½	.04½
133-137 deg. M. P.....lb.	.05	.05¼	.05	.05¼	.043	.05¼
Para Aldehyde, 110-55 gal drs.lb.*	.16	.18	.16	.18	.16	.18
Aminoacetanilid, 100 lb bg..lb.	.52	.60	.52	.60	.52	.60
Aminohydrochloride, 100 lb. kegs.....lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kegs...lb.	.78	.80	.78	.80	.78	.80
Chlorophenol, drums.....lb.	.50	.65	.50	.65	.50	.65
Coumarone, 330 lb drums..lb.	....	....	.....	.....	....	....
Cymene, refd, 110 gal dr..gal.	2.25	2.50	2.25	2.50	2.25	2.50
Dichlorobenzene, 150 lb bbls wks.....lb.	.16	.20	.16	.20	.15	.18
Nitroacetanilid, 300 lb bbls.lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls wks .....lb.	.48	.55	.48	.55	.48	.55
Nitrochlorobenzene, 1200 lb drs wks.....lb.	.23½	.24	.23½	.24	.23½	.26
Nitro-orthotoluidine, 300 lb. bbls.....lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol 185 lb bbls....lb.	.45	.50	.45	.50	.45	.50
Nitrosodimethylaniline, 120 lb. bbls.....lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls...lb.	.35	.37	.35	.37	.29	.37
Phenylenediamine, 350 lb bbls .....lb.	1.25	1.30	1.25	1.30	1.15	1.30
Toluenesulfonamide, 175 lb bbls.....lb.	.70	.75	.70	.75	.70	.75
Toluenesulfonchloride, 410 lb bbls wks.....lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls wk..lb.	.56	.60	.56	.60	.56	.60
Paris Green, Arsenic Basis 100 lb kegs.....lb.	....	.23	.....	.23	....	.24
250 lb kegs.....lb.	....	.22	.....	.22	....	.23
Perchlorethylene, 50 gal. dr...lb	....	.15	.....	.15	....	....
Persian Berry Ext., bbls.....lb.	.25	Nom.	.25	Nom	.25	Nom
Pentane, normal, 28-38° C, group 3, tanks.....gal.	....	.09	.....	.09	....	....
Pentasol (see Alcohol, Amyl)...						
Pentasol Acetate (see Amyl Acetate).....						
Petrolatum, Green, 300l b bbl. lb.	.01⅞	.02	.01⅞	.02	.01⅞	.02
Petroleum Ethers, tanks 30-60°, Group 3.....gal.	....	.13	.11	.13	.10	.11
Petroleum solvents and diluents Cleaners' naphtha, Group 3, tanks.....gal.	.06⅛	.07⅛	.06⅛	.07⅛	.05	.07⅛
Lacquer diluents, Bayonne tanks.....gal.	.12	.12½	.12	.12½	.12	.12¾
Group 3, tanks.....gal.	.06⅞	.07⅛	.06⅞	.08⅛	.06¼	.08⅛
Petroleum thinner 47-49 deg. tanks, Group 3.....gal.	.05⅞	.06⅛	.05⅞	.06⅛	....	....
Rubber solvent, stand. grade tanks, Group 3.....gal.	....	.06⅞	.....	.06⅞	.05	.06⅞
East Coast tanks.....gal.	....	.09½	.....	.09½	.09	.09½
Stoddard solvents 48-50 deg. tanks, Group 3.....gal.	.06⅞	.07⅛	.06⅛	.07⅛	.04½	.06⅛
East Coast tanks.....gal.	....	.09½	.....	.09½	.09	.09½
Phenol, 250-100 lb drums....lb.	.14¼	.15	.14¼	.15	.14¼	.15
Phenyl-Alpha-Naphthylamine, 100 lb kegs.....lb.	....	1.35	.....	1.35	....	1.35

*Higher price is for lcl quantities.

Phenyl Chloride
Rosin

Prices

	Current Market		1934 Low	1934 High	1933 Low	1933 High
Phenyl Chloride, drums.....lb.	....	.16	.....	.16	....	....
Phenylhydrazine Hydrochloride .....lb.	2.90	3.00	2.90	3.00	2.90	3.00
Phosphate Acid (see Superphosphate)						
Phosphate Rock, f.o.b. mines						
Florida Pebble, 68% basis..ton	2.85	3.20*	2.85	3.20*	2.75	3.25
70% basis.....ton	3.35	3.70*	3.35	3.70*	3.25	3.90
72% basis.....ton	3.85	4.20*	3.85	4.20*	3.75	4.35
75-74% basis.....ton	4.90	5.30*	4.90	5.30*	4.75	5.50
75% basis.....ton	5.05	5.40*	5.05	5.40*	4.85	5.75
77-80% basis.....ton	5.90	6.20*	5.90	6.20*	5.75	6.30
Tennessee, 72% basis.....ton	....	5.00*	.....	5.00*	....	5.00
Phosphorous Oxychloride 175 lb cyl.....lb.	.16	.20	.16	.20	.16	.23
Red, 110 lb cases.....lb.	....	.45	.....	.45	.40	.45
Yellow, 110 lb cases wks.lb.	.28	.33	.28	.33	.27½	.33
Sesquisulfide, 100 lb cs.....lb.	.38	.44	.38	.44	.38	.44
Trichloride, cylinders.....lb.	.16	.20	.16	.20	.16	.23
Phthalic Anhydride, 100 lb bbls wks.....lb.	.14½	.15	.14½	.15	.13½	.16
Pigments Metallic, Red or brown bags, bbls, Pa. wks.....ton	37.00	45.00	37.00	45.00	37.00	45.00
Pine Oil, 55 gal drums or bbls						
Destructive dist.....lb.	.59	.62	.59	.62	.59	.62
Prime bbls.....bbl.	8.00	10.60	8.00	10.60	8.00	10.60
Steam dist. bbls.....gal.	....	.59	.....	.59	.52	.59
Pitch Hardwood..... wks.....ton	....	20.00	.....	20.00	20.00	25.00
Plaster Paris, tech, 250 lb bbls .....bbl.	3.40	3.50	3.40	3.50	3.30	3.50
Platinum, Refined.....oz.	37.00	38.00	37.00	38.00	24.00	38.00
Pontol, tanks.....per gal.	....	.54	.....	.54	....	.54
Potash, Caustic, wks, solid...lb.	.07½	.07¾	.07½	07¾	.06½	.07¾
flake.....lb.	.0803	.08½	.0803	.08½	.0705	.08½
Liquid, tanks .....lb.	....	.03¾	.....	.03¾	....	....
Potash Salts, Rough Kainit						
12.4% basis bulk.....ton	....	9.20	.....	9.20	....	9.20
14% basis.....ton	....	9.70	.....	9.70	....	9.70
Manure Salts.....						
20% basis bulk.....ton	....	12.00	.....	12.00	....	12.00
30% basis bulk.....ton	....	19.15	.....	19.15	....	19.15
Potassium Acetate.....lb.	.27	.28	.27	.28	.27	.28
Potassium Muriate, 80% basis bags.....ton	....	37.15	.....	37.15	....	37.15
Pot. & Mag. Sulfate, 48% basis bags.....ton	....	25.00	.....	25.00	25.00	27.80
Potassium Sulfate, 90% basis bags.....ton.	....	42.15	....	42.15	42.15	47.50
Potassium Bicarbonate, USP, 320 lb bbls.....lb.	.07½	.09	.07½	.09	.07½	.09
Bichromate Crystals, 725 lb casks.....lb.	.08⅛	.08⅝	.08⅛	.08⅝	.07¼	.08⅛
Binoxalate, 300 lb bbls.....lb.	.14	.17	.14	.17	.14	.17
Bisulfate, 100 lb kegs.....lb.	.16	.30	.16	.30	.16	.30
Carbonate, 80-85% calc. 800 lb casks.....lb.	.07	.07½	.07	.07½	.04¾	.07½
Chlorate crystals, powder 112 lb keg wks.....lb.	....	.09	.08½	.09	.08	.09
Chloride, crys bbls.....lb.	.04	.04¼	.04	.04¼	.04	.04¼
Chromate, kegs.....lb.	.23	.28	.23	.28	.23	.28
Cyanide, 110 lb. cases.....lb.	.55	.60	.55	.60	.50	.60
Iodide, 75 lb. bbls.....lb.	....	2.70	.....	2.70	2.35	2.70
Metabisulfite, 300 lb. bbl...lb.	.10½	.11	.10½	.11	.10½	.11
Oxalate, bbls.....lb.	.16	.24	.16	.24	.16	.24
Perchlorate, casks wks.....lb.	.09	.11	.09	.11	.09	.11
Permanganate, USP, crys 500 & 100 lb drs wks.....lb.	.18½	.19½	.18½	.19½	.17½	.19½
Prussiate, red, 112 lb keg...lb.	.39	.41	.35	.39	.39	.41
Yellow, 500 lb casks.....lb.	.18	.19	.18	.19	.16½	.19
Tartrate Neut, 100 lb keg...lb.	....	.21	.....	.21	....	.21
Titanium Oxalate, 200 lb bbls .....lb.	.32	.35	.32	.35	....	....
Propane, group 3, tanks.....	....	.07	.....	.07	....	.07
Pumice Stone, lump bags.....lb.	.04½	.06	.04½	.06	.04	.06
250 lb bbls.....lb.	.05	.07	.05	.07	.04½	.07
Powdered, 350 lb bags.....lb.	.02½	.03	.02½	.03	.02½	.03
Putty, commercial, tubs..100 lb.	....	2.25	....	2.25	2.00	2.25
Linseed Oil, kegs.....100 lb.	4.00	4.50	4.00	4.50	3.40	4.50
Pyridine, 50 gal drums .....gal.	....	1.25	.....	1.25	.85	1.25
Pyrites, Spanish cif Atlantic ports bulk.....unit	.12	.13	.12	.13	.12	.13
Quebracho, 35% liquid tks...lb.	....	.02⅜	.....	.02⅜	.02	.02⅜
450 lb bbls c-l .....lb.	....	.02⅝	.....	.02⅝	.02⅜	.02⅝
Solid, 63%, 100 lb bales cif..lb.	....	.02¾	.02¾	.03⅜	.02⅝	.03⅜
Clarified, 64%, bales... lb.	....	.03	.03	.03½	.02⅜	.03½
Quercitron, 51 deg liquid 450 lb bbls.....lb.	.05½	.06	.05½	.06	.05½	.06
Solid, 100 lb boxes.....lb.	.09½	.13	.09½	.13	.09½	.13
Bark, Rough.....ton	....	14.00	.....	14.00	....	14.00
Ground.....ton	34.00	35.00	34.00	35.00	34.00	35.00
R Salt, 250 lb bbls wks.....lb.	.40	.44	.40	.44	.40	.44
Red Sanders Wood, grd bbls. lb.	....	.18	.....	.18	....	.18
Resorcinol Tech, cans.....lb.	.65	.75	.65	.75	.65	.70
Rochelle Salt, cryst.....lb.	....	.12½	.....	.12½	....	....
Rosin Oil, 50 gal bbls, first run .....gal.	.45	.46	.45	.46	.42	.46
Second run.....gal.	.50	.51	.50	.51	.46	.51
FF Wood Rosin, c. l. N.Y.....	....	5.05	.....	5.05	....	....
Rosins 600 lb bbls 280 lb.....unit ex. yard N. Y.						
B.....	....	4.75	4.50	4.75	2.75	5.15
D.....	....	4.80	4.60	4.80	2.95	5.15
E.....	....	5.50	4.80	5.50	3.55	5.15
F.....	....	5.75	5.00	5.75	3.85	5.17½
G.....	....	5.75	5.05	5.75	3.90	5.17½
H.....	....	5.80	5.10	5.80	4.00	5.17½
I.....	....	5.85	5.15	5 85	4.05	5.20
K.....	....	5.87½	5.30	5.87½	4.60	5.20
M.....	....	5.90	5.50	5.90	4.35	5.25
N.....	....	5.90	5.50	5.90	4.75	5.40

*Higher prices run to Jan.-June 1935.

Current

Rosin
Starch, Potato

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Rosin, WG	5.95	5.95	6.25	4.80	5.60
WW	6.25			4.85	6.20
Rotten Stone, bags mines....ton	23.50	24.00	23.50	24.00	23.50	24.00
Lump, imported, bbls.....lb.	.05	.07	.05	.07	.05	.07
Selected bbls.....lb.	.09	.12	.09	.12	.09	.12
Powdered, bbls.....lb.	.02½	.05	.02½	.05	.02	.05
Sago Flour, 150 lb bags.....lb.	.02½	.03	.02½	.03	.02½	.03
Sal Soda, bbls wks.....100 lb.	1.10	1.10	1.10	1.10	.90	1.10
Salt Cake, 94-96% c-l wks...ton	13.00	18.00	13.00	18.00	13.00	18.00
Chrome.....ton	12.00	13.00	12.00	13.00	12.00	13.00
Saltpetre, double refd granular 450-500 lb bbls.....lb.		.06		.06	.05¾	.06¾
Satin, White, 500 lb bbls.....lb.		.01½		.01½		.01½
Shellac Bone dry bbls.....lb.	.29	.31	.29	.31	.18	.28
Garnet, bags.....lb.	.24	.25	.24	.25	.15	.20
Superfine, bags.....lb.	.23	.23¾	.23	.23¾	.09½	.18¾
T. N. bags.....lb.	.21	.21¾	.21	.21¾	.08½	.17¾
Schaeffer's Salt kegs.....lb.	.48	.50	.48	.50	.48	.50
Silica, Crude, bulk mines....ton	8.00	11.00	8.00	11.00	8.00	11.00
Refined, floated bags.....ton	22.00	30.00	22.00	30.00	22.00	30.00
Air floated bags.....ton		32.00		32.00		32.00
Extra floated bags.....ton	30.00	35.00	30.00	35.00	30.00	35.00
Silver Nitrate, vials.....oz.	.32¼	.32¾	.32¼	.33		
Soapstone, Powdered, bags f.o.b. mines.....ton	15.00	22.00	15.00	22.00	15.00	22.00
Soda Ash, 58% dense, bags c-l wks.....100 lb.		1.25		1.25	1.17½	1.25
58% light, bags.....100 lb.		1.23		1.23	1.15	1.23
Soda Caustic, 76% grnd & flake drums.....100 lb.		3.00		3.00	2.90	3.00
76% solid drs.....100 lb.		2.60		2.60	2.50	2.60
Liquid sellers tanks, 100 bls.		2.25		2.25	2.15	2.25
Sodium Abietate, drs.....lb.		.03		.03		.03
Acetate, tech 450 lb. bbls wks lb.	.04¾	.05	.04¾	.05	.04¼	.05
Alignate, drs.....lb.		.50		.50		.50
Arsenate, drums.....lb.	.07¾	.08¾	.07¾	.08¾	.07¾	.08¼
Arsenite, drums.....gal.	.50	.75	.50	.75	.05	.75
Benzoate U.S.P., kegs.....lb.	.45	.47	.45	.47		
Bicarb, 400 lb bbl.....100 lb.		2.25		2.25		2.25
Bichromate, 500 lb cks wks lb.	.06½	.06¾	.06½	.06¾	.044	.07
Bisulfite, 500 lb bbl wks....lb.	.03	.0335	.03	.0335	.02¾	.0335
Chlorate, wks.....lb.	.06¼	.07½	.06¼	.07½	.05¾	.07¾
Chloride, technical.....ton	11.40	14.00	11.40	14.00	11.40	14.00
Cyanide, 96-98%, 100 & 250 lb drums wks.....lb.		.16½		.16½	.15½	.16
Fluoride, 300 lb bbls wks....lb.	.07½	.09½	.07½	.09½	.07	.07½
Hydrosulfite, 200 lb bbls f.o.b. wks.....lb.	.20	.21	.20	.21	.20	.21
Hypochloride solution, 100 lb. cbys.....lb.		.05		.05		.05
Hyposulfite, tech, pea cyrs 375 lb bbls wks.....100 lb.	2.40	3.00	2.40	3.00	2.40	3.00
Technical, regular crystals 375 lb bbls wks....100 lb.	2.40	2.65	2.40	2.65	2.40	2.65
Iodide.....lb.		3.50		3.50	3.10	3.50
Metanilate, 150 lb bbls....lb.	.41	.42	.41	.42	.44	.45
Metasilicate, c-l, wks..100 lb.	2.65	3.05	2.65	3.05	2.65	3.25
Monohydrate, bbls.....lb.		.02½		.02½		.02½
Naphthionate, 300 lb bbl...lb.	.52	.54	.52	.54	.52	.54
Nitrate, 92%, crude, 200 lb. bags c-l NY .....100 lb.		1.31½		1.31½	1.26	1.31½
100 lb. bags lb. .....ton		27.00		27.00		
Bulk.....ton		24.50		24.50		
Nitrite, 500 lb bbls spot....lb.	.07¼	.08	.07¼	.08	.07¼	.08
Orthochlorotoluene, sulfonate, 175 lb bbls wks.....lb.	.25	.27	.25	.27	.25	.27
Perborate, 275 lb bbls.....lb.	.18	.19	.18	.19	.17	.19
Peroxide, bbls. 400 lb.....lb.		.17		.17		
Phosphate, di-sodium, tech. 310 lb bbls.....100 lb.	2.20	2.40	2.20	2.40	2.00	2.40
tri-sodium, tech, 325 lb bbls.....100 lb.		2.60		2.60	2.15	2.50
Picramate, 160 lb kegs ....lb.	.69	.72	.69	.72	.69	.72
Prussiate, Yellow, 350 lb bbl wks.....lb.	.11½	.12	.11½	.12	.11½	.12
Pyrophosphate, 100 lb keg..lb.	.16½	.18	.16½	.18	.15	.20
Silicate, 60 deg 55 gal drs, wks .....100 lb.	1.65	1.70	1.65	1.70	1.65	1.70
40 deg 55 gal drs, wks .....100 lb.		.80*		.80*	.75	.80
Silicofluoride, 450 lb bbls NY .....lb.	.05	.06	.05	.06	.04½	.06
Stannate, 100 lb drums.....lb.	.34	.34½	.34	.35	.18	.37
Stearate, bbls.....lb.	.20	.25	.20	.25	.20	.25
Sulfanilate, 400 lb bbls.....lb.	.16	.18	.16	.18	.16	.18
Sulfate Anhyd, 550 lb bbls c-l wks.....lb.	.022	.0285	.022	.0285	.02	.0285
Sulfide, 80% crystals, 440 lb bbls wks.....lb.	.02½	.02¾	.02½	.02¾	.02½	.02¾
62% solid, 650 lb drums 1c-1 wks.....lb.	.03	.03¼	.03	.03¼	.03	.03¼
Sulfite, crystals, 400 lb bbls wks.....lb.	.02¼	.02½	.02¼	.02½	.03	.03¼
Sulfocyanide, bbls .....lb.	.28	.35	.28	.35	.28	.35
Tungstate, tech, crystals, kegs .....lb.	.70	.75	.70	.75	.57	.67
Spermaceti, blocks, cases.....lb.	.18	.19	.18	.19	.17	.22
Cakes, cases.....lb.	.19	.20	.19	.20	.18	.23
Spruce Extract, ord., tanks..lb.		.01		.01	.00¾	.01
Ordinary, bbls.....lb.		.01½		.01½	.01¼	.01½
Super spruce ext., tanks...lb.		.01¾		.01¾	.01½	.01¾
Super spruce ext., bbls....lb.		.01½		.01½	.01¾	.01½
Super spruce ext. powd., bags .....lb.		.04		.04		.04
Starch, powd, 140 lb bags .....100 lb.	2.81	3.01	2.81	3.01	2.29	3.01
Pearl, 140 lb bags.....100 lb.	2.71	2.91	2.71	2.91	2.19	2.91
Potato, 200 lb bags.....lb.	.05¼	.06	.05¼	.06	.03¾	.06
Imported bags.....lb.	.06	.06½	.06	.06½	.04¼	.06½

*Tanks, 15c less.

Starch, Potato
Zinc Dithiofuroate

Prices

		Current Market		1934 Low	1934 High	1933 Low	1933 High
Starch, Potato Soluble	lb.	.08	.08½	.08	.08½	.08	.08½
Rice, 200 lb bbls	lb.	.07½	.08½	.07½	.08½	.07	.08½
Wheat, thick bags	lb.	.06½	.06½	.06½	.06½	.05½	.06½
Thin bags	lb.	.10	.10½	.10	.10½	.09½	.10½
Strontium carbonate, 600 lb bbls wks	lb.	.07½	.07½	.07½	.07½	.07½	.07½
Nitrate, 600 lb bbls NY	lb.	.10½	.11	.10½	.11	.07	.11
Peroxide, 100 lb drs	lb.	....	1.25	.....	1.25	....	1.25
Sulfur Brimstone, broken rock, 250 lb bag c-l	100 lb.	....	2.05	.....	2.05	....	2.05
Crude, f. o. b. mines	ton	18.00	19.00	18.00	19.00	18.00	19.00
Flour for dusting 99½%, 100 lb bags c-l NY	100 lb.	....	2.40	.....	2.40	....	2.40
Heavy bags c-l	100 lb.	....	2.50	.....	2.50	....	2.50
Flowers, 100%, 155 lb bbls c-l NY	100 lb.	....	3.45	.....	3.45	....	3.45
Roll, bbls lc-l NY	100 lb.	2.65	2.85	2.65	2.85	2.65	2.85
Sulfur Chloride, red, 700 lb drs wks	lb.	.05	.05½	.05	.05½	.05	.05½
Yellow, 700 lb drs wks	lb.	.03½	.04½	.03½	.04½	.03½	.04½
Sulfur Dioxide, 150 lb cyl	lb.	.07	.08	.07	.08	.07	.08
Extra, dry, 100 lb cyl	lb.	.11	.13	.11	.13	.10	.13
Sulfuryl Chloride	lb.	.15	.40	.15	.40	.15	.40
Sumac, Italian, ground	ton	....	69.00	69.00	75.00	50.00	75.00
Talc, Crude, 100 lb bgs NY	ton	12.00	15.00	12.00	15.00	12.00	15.00
Refined, 100 lb bgs NY	ton	16.00	18.00	16.00	18.00	16.00	18.00
French, 220 lb bags NY	ton	27.50	30.00	27.50	30.00	18.00	30.00
Refined, white, bags	ton	45.00	60.00	45.00	60.00	35.00	60.00
Italian, 220 lb bags to arr.	ton	70.00	75.00	70.00	75.00	48.50	75.00
Refined, white bags N.Y.	ton	75.00	80.00	75.00	80.00	50.00	80.00
Superphosphate, 16% bulk, wks	ton	....	8.00	.....	8.00	6.50	8.00
Run of pile	ton	....	7.50	.....	7.50	6.00	7.50
Tankage Ground NY	unit	....	2.50*	.....	2.50*	1.70	2.75*
Unground	unit	....	2.35	.....	2.35	2.35	2.60
High grade f.o.b. Chicago	unit	....	2.20*	1.90	2.20*	1.40	3.00
South American cif	unit	....	3.00*	.....	3.00*	....	2.50
Tapioca Flour, high grade bgs	lb	.03	.05	.03	.05	.03	.05
Medium grade, bags	lb.	.03	.04	.03	.04	.03	.04
Tar Acid Oil, 15%, drums	gal.	.21	.22	.21	.22	.20	.22
25% drums	gal.	.23	.24	.23	.24	.22	.24
Tartar Emetic, Tech	gal.	....	.21¾	.....	.21¾	....	....
U. S. P.	gal.	....	.27	.....	.27	....	....
Terra Alba Amer. No. 1, bgs or bbls mills	100 lb.	1.15	1.75	1.15	1.75	1.15	1.75
No. 2 bags or bbls	100 lb.	1.00	1.25	1.00	1.25	1.00	1.25
Imported bags	lb.	.01½	.01½	.01½	.01½	.01½	.01½
Tetrachlorethane, 50 gal dr	lb.	.08½	.09	.08½	.09	.08½	.09
Tetralene, 50 gal drs wks	lb.	.12	.13	.12	.13	.12	.13
Thiocarbanilid, 170 lb bbl	lb.	.20	.25	.20	.25	.25	.28½
Tin							
Crystals, 500 lb bbls wks	lb.	....	.38	.30	.38	.24	.41
Metal Straits NY	lb.	....	.50⅞	.....	.50⅞	.23	.57
Oxide, 300 lb bbls wks	lb.	.55	.57	.55	.59	.27½	.59
Tetrachloride, 100 lb drs wks	lb.	.25½	.26	.25½	.27	.126	.28
Titanium Dioxide 300 lb bbl	lb.	.17½	.19½	.17½	.19½	.17½	.19½
Calcium Pigment, bbls	lb.	.06½	.06½	.06½	.06½	.06½	.06½
Toluene, 110 gal drs	gal.	....	.35	.....	.35	....	.35
8000 gal tank cars wks	gal.	....	.30	.....	.30	....	.30
Toluidine, 350 lb bbls	lb.	.88	.89	.88	.89	.88	.89
Mixed, 900 lb drs wks	lb.	.27	.28	.27	.28	.27	.28
Toner Lithol, red, bbls	lb.	.80	.85	.80	.85	.80	.95
Para, red, bbls	lb.	....	.80	.....	.80	....	.80
Toluidine	lb.	....	1.35	.....	1.35	1.35	1.55
Triacetin, 50 gal drs wks	lb.	.32	.36	.32	.36	.32	.36
Trichlorethylene, 50 gal dr	lb.	.09½	.10	.09½	.10	.09½	.10
Triethanolamine, 50 gal drs	lb.	.35	.38	.35	.38	.35	.38
Tricresyl Phosphate, drs	lb.	.19	.26	.19	.26	.19	.26
Triphenyl guanidine	lb.	.58	.60	.58	.60	.58	.60
Phosphate, drums	lb.	.37	.39	.37	.39	.37	.39
Tripoli, 500 lb bbls	100 lb.	.75	2.00	.75	2.00	.75	2.00
Tungsten, Wolframite	per unit	12.00	12.50	12.00	12.50	10.00	12.50
Turpentine carlots, N. Y. dock bbls.	gal.	....	.56½	.47¾	.56½	.46½	.51½
Savannah, bbls	gal.	....	.49	.42½	.49	....	....
Jacksonville, bbls	gal.	....	.47½	.43	.47½	....	....
Wood Steam dist, bbls, c. l. N. Y.	gal.	....	.49	.44	.49	.42	.48
Urea, pure, 112 lb cases	lb.	.15	.17	.15	.17	.15	.17
Fert. grade, bags c.i.f.	ton	....	90.00	.....	90.00	82.60	90.00
c. i. f. S. points	ton	....	90.00	.....	90.00	82.60	90.00
Urea Ammonia liq. 55% NH_3, tanks	unit	....	.96	.....	.96	....	....
Valonia Beard, 42%, tannin bags	ton	....	40.00	.....	40.00	27.50	42.00
Cups, 30-31% tannin	ton	....	23.00	23.00	25.00	17.00	25.00
Mixture, bark, bags	ton	....	28.00	.....	28.00	22.00	28.00
Vermillion, English, kegs	lb.	1.41	1.42	1.41	1.42	1.05	1.42
Vinyl Chloride, 16 lb cyl	lb.	....	1.00	.....	1.00	....	1.00
Wattle Bark, bags	ton	32.00	34.00	32.00	34.00	24.00	32.00
Extract 55%, tanks, bbls.	lb.	....	.05½	.....	.05½	.03	.05½
Whiting, 200 lb bags, c-l wks	100 lb.	.85	1.00	.85	1.00	.85	1.00
Alba, bags c-l NY	ton	....	15.00	.....	15.00	13.00	15.00
Gilders, bags c-l NY	100 lb.	....	1.35	.....	1.35	....	1.35
Wood Flour, c-l	bags	18.00†	30.00	18.00†	30.00	18.00	36.00
Xylene, 10 deg tanks wks	gal.	....	.29	.....	.29	.29	.29
Commercial, tanks wks	gal.	....	.26	.....	.26	....	.26
Xylidine, crude	lb.	.36	.37	.36	.37	.36	.37
Zinc Ammonium Chloride powd., 400 lb bbls	lb.	.04¾	.05	.04¾	.05	.04¾	.05
Carbonate Tech. bbls NY	lb.	.09½	.11	.09½	.11	.09½	.11
Chloride Fused, 600 lb drs wks	lb.	.04¼	.05	.04¼	.05	.05	.05¾
Gran, 500 lb bbls wks	lb.	....	.05⅛	.05⅛	.06	.05⅛	.06
Soln 50%, tanks wks	100 lb.	....	2.00	.....	2.00	....	3.00
Cyanide, 100 lb drums	lb.	.38	.39	.38	.39	.38	.39
Dithiofuroate, 100 lb dr	lb.	....	1.00	.....	1.00	....	1.00

*&10 †Depends upon grade

Current

Zinc Dust
Whale Oil

	Current Market		1934 Low	1934 High	1933 Low	1933 High
Zinc Dust, 500 lb bbls c-1 wks	lb.	.0705	.071	.0705	.071	.04¾	.07½
Metal, high grade slabs c-1 NY	100 lb.	....	4.65	4.65	4.87	3.02	5.37
Oxide, American bags wk	lb.	.05½	.06½	.05¾	.06½	.05	.06
French, 300 lb bbls wks	lb.	.05¾	.11⅝	.05¾	.11⅛	.05¾	.11½
Palmitate, bbls	lb.	.20	.21	.20	.21	.17½	.21
Perborate, 100 lb drs	lb.	....	1.25	.....	1.25	....	1.25
Peroxide, 100 lb drs	lb.	....	1.25	.....	1.25	....	1.25
Resinate, fused, dark, bbls	lb.	.05¾	.06½	.05¾	.06½	.05¾	.06½
Stearate, 50 lb bbls	lb.	.18	.19	.18	.19	.15	.19
Sulfate, 400 bbl wks	lb.	.02¾	.03	.02¾	.03	.03	.03½
Sulfide, 500 lb bbls	lb.	.13	.13½	.13	.13½	.12	.13½
Sulfocarbolate, 100 lb keg	lb.	.21	.22	.21	.22	.21	.22
Zirconium Oxide, Nat. kegs	lb.	.02½	.03	.02½	.03	.02½	.03
Pure kegs	lb.	.45	.50	.45	.50	.45	.50
Semi-refined kegs	lb.	.08	.10	.08	.10	.08	.10

Oils and Fats

Castor, No. 1, 400 lb bbls	lb.	....	.09¾	.....	.09¾	.09¼	.10
No. 3, 400 lb bbls	lb.	....	.09¾	.....	.09¾	.08½	.09¾
Blown, 400 lb bbls	lb.	.12¼	.12¾	.12¼	.12¾	.11¼	.12¾
China Wood, bbls spot NY	lb.	.07⅜	.07½	.07⅜	.07¼	.04¼	.09⅛
Tanks, spot NY	lb.	.07¼	.07⅜	.07¼	.07⅜	.04¼	.08½
Coast, tanks	lb.	.06⅞	.07	.06⅞	.07	.04⅛	.08½
Coconut, edible, bbls NY	lb.	....	.10¾	.....	.10¾	....	.10¾
Ceylon, 375 lb bbls NY	lb.	.03⅞	.04	.03⅞	.04	.03¾	.04¼
8000 gal tanks NY	lb.	.02½	.02¾	.02½	.02¾	.02½	.03⅛
Cochin, 375 lb bbls NY	lb.	.04½	.04⅝	.04½	.04⅝	.04½	.05¼
TanksN Y	lb.	.04¼	Nom.	.04¼	Nom.	.04	.05
Manila, bbls NY	lb.	.03⅞	.04	.03⅞	.04	.03⅞	.04¾
Tanks NY	lb.	.02¾	.03	.02¾	.03	.02¾	.03¾
Tanks, Pacific Coast	lb.	.02½	.02⅞	.02½	.02⅞	.02½	.03⅛
Cod, Newfoundland, 50 gal bbls	gal.	.40	Nom.	34	.40	.19	.35
Copra, bags, N. Y.	lb.	.0135	.015	.0135	.016	.0152½	.019
Corn, crude, bbls NY	lb.	.04¾	.04⅞	.04⅝	.05	.04⅝	.07¾
Tanks, mills	lb.	.03⅞	.03⅞	.03½	.03⅞	.02¼	.06½
Refined, 375 lb bbls NY	lb.	.05¾	.06	.05¾	.06	.05¾	.08¾
Cottonseed, crude, mill Southeast & Valley	lb.		*(See Oils and Fats News Section)*				
Texas	lb.		*(See Oils and Fats News Section)*				
Degras, American, 50 gal bbls NY	lb.	.02¾	.03	.02¾	.03	.02½	.03
English, brown, bbls NY	lb.	.03¾	.04	.03¾	.04	.02½	.04
Greases, Brown	lb.	.02	.02½	.02	.02½	.02	.03½
Yellow	lb.	.02¾	.02⅝	.02¾	.03	.01¾	.03⅝
White, choice bbls NY	lb.	.02¾	.03⅜	.02¾	.03⅜	.02¾	.04⅜
Herring, Coast, Tanks	gal.	.15	Nom.	.15	.15	.11	.23
Lard Oil, edible, prime	lb.	....	.09¾	.....	.09¾	.08½	.10½
Extra, bbls	lb.	....	.07½	.....	.07¼	.07½	.08¼
Extra No. 1, bbls	lb.	....	.07½	.....	.07½	.06	.08
Linseed, Raw, lessthan5bbl.lots	lb.	....	.101	.101	.105	.08	.12
Bbls c-1 spot	lb.	....	.093	.093	.097	.072	.11
Tanks	lb.	....	.087	.087	.091	.066	.104
Menhaden Tanks, Baltimore	gal.	.15	.17	.15	.17	.09	.15
Refined, alkali bbl	lb.	.063	.069	.063	.069	....	....
Tanks	lb.	....	.059	.059	.061	....	....
Light Pressed, bbls	lb.	.051	.057	.051	.057	....	....
Tanks	lb.	....	.047	.047	.049	....	....
Neatsfoot, CT, 20° bbls NY	lb.	....	.16½	.....	.16½	.11¾	.16¾
Extra, bbls NY	lb.	....	.07¾	.....	.07¾	.06½	.08¼
Pure, bbls NY	lb.	....	.13	.....	.13	.07¼	.14
Oleo, No. 1, bbls NY	lb.	....	.06½	....	.06½	.05	.06⅞
No. 2, bbls NY	lb.	....	.05⅞	.05⅜	.05⅞	.04¼	.06⅜
Olive, denatured, bbls NY	gal.	.82	.86	.76	.86	.47	.80
Edible, bbls NY	gal.	1.65	1.90	1.60	1.90	1.30	1.85
Foots, bbls NY	lb.	.06½	.06⅝	.06½	.06⅝	.04⅜	.06¾
Palm, Kernel Casks	lb.	.04½	Nom.	.04½	Nom.	.04	.04¾
Lagos, 1500 lb casks	lb.	.03½	.03⅞	.03½	.03⅞	.02⅛	.04¼
Niger, Casks	lb.	.03⅜	.03¾	.03⅜	.03¾	.024	.04½
Peanut, crude, bbls NY	lb.	....	.06½	.....	.06½	.03½	.07
Refined, bbls NY	lb.	.07¼	.10½	.07¼	.10½	.07½	.11
Perilla, bbls NY	lb.	.08⅝	.08⅝	.08½	.08⅝	.05	.10½
Tanks, Coast	lb.	.07¾	Nom.	.07¾	.07¾	.03¾	.09¼
Poppyseed, bbls NY	gal.	1.45	1.60	1.45	1.60	1.45	1.70
Rapeseed, blown, bbls NY	gal.	.08	.082	.08	082	....	....
denatured, drms, NY	gal.	.41½	.42½	.41½	.44	.34	.65
Red, Distilled, bbls	lb.	.07	.07⅜	.07	.07⅜	.05⅞	.07⅜
Tanks	lb.	....	.06	.....	.06	.05	.06
Salmon, Coast, 8000 gal tks	gal.	.15	Nom.	.15	.17	.11	.18
Sardine, Pacific Coast tks	gal.	.13	Nom.	.13	.16	.09½	.20
Sesame, edible, yellow, dos	lb.	.08½	.09	.08½	.09	.08½	.10
White, dos	lb.	.09	.09½	.09	.09½	.10	.11
Sod, bbls NY	gal.	....	.40	.....	.40	....	.40
Soy Bean, crude							
Pacific Coast	lb.	....	Nom.	.....	Nom.	.032	.035
Domestic tanks, f.o.b. mills	lb.	.....	.06	.06	.061	.027	.085
Crude, bbls NY	lb.	.066	.07	.066	.071	.04	.095
Refined, bbls NY	lb.	.071	.082	.071	.082	.04½	.106
Sperm, 38° CT, bleached, bbls NY	lb.	.108	.11	.108	.11	....	....
45° CT, bleached, bbls NY	lb.	.101	.103	.101	.103	....	....
Stearic Acid, double pressed dist bags	lb.	.09½	.10	.09½	.10	.07½	.10
Double pressed saponified bags	lb.	.09½	.10	.09½	.10	.08	.10
Triple, pressed dist bags	lb.	.12¼	.12½	.12¼	.12¾	.10¼	.12¾
Stearine, Oleo, bbls	lb.	.05	.05½	.....	.05½	.03½	.06¾
Tallow City, extra loose	lb.	....	.02⅞	.02⅞	.03	.02	.03¼
Edible, tierces	lb.	....	.04¼	.....	.04¼	.03½	.05⅛
Tallow Oil, Bbls, c-1 NY	lb.	.05¾	.06	.05¾	.06	.05¾	.06
Acidless, tanks NY	lb.	....	.06¾	.....	.06¾	.05	.07¼
Vegetable, Coast mats	lb.	.06	Nom.	.06	Nom.	.04½	.06
Turkey Red, single, bbls	lb.	.07½	....	.07½	....	.06¼	.07½
Double, bbls	lb.	.12½	.13	.12½	.13	.08	.13
Whale,							
Winter bleached, bbls, NY	lb.	....	.072	.....	.072	....	....
Refined natural, bbls, NY	lb.	.068	.07	.068	.07	....	....

THE CHEMICAL MARKET-PLACE

Local Suppliers

A selected Directory of responsible manufacture-sales agents, and jobbers who maintain spot stocks of chemicals, dye and tanstuffs, gums, naval stores, paint and fertilizer materials, and similar products.

Let us tell you about our combination contract for space on this page and in our 1934 Chemical Guide-Book.

MASSACHUSETTS

DOE & INGALLS, INC.

Chemicals
Solvents

DENATURED ALCOHOL

Full List of Our Products, See Chemical Guide-Book

Everett Station, Boston — EVerett 4610

E. & F. KING & Co., Inc.

Est. 1834

399-409 Atlantic Avenue
Boston, Mass.

Headquarters for
Industrial Chemicals

(CO_2)
Solid Carbon Dioxide

RHODE ISLAND

ANILINE OIL

Heavy Chemicals
Textile Specialties

J. U. STARKWEATHER CO.
INCORPORATED
705 Hospital Trust Bldg.
Providence, R. I.

GEO. MANN & CO., INC.
251 Fox Pt. Blvd., Providence, R. I.
(Phone—Gaspee 8466)
Branch Office
Pier #1, Northern Ave., Boston, Mass.
(Phone—Liberty 8939)

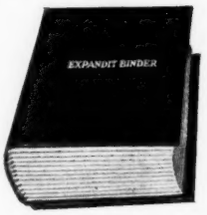
Industrial Chemicals
Glycerine
Stearic Acid

"CHEMICAL MARKETS" Contains Much Valuable Information

Why Not Keep Your Copies Handy For Reference?

The "EXPANDIT" Binder Enables You to Do This

THE ***"Expandit" Binder*** is so constructed that it will always open flat, whether it be filled to its capacity of six inch expansion, or whether it contains only one issue. Its back is ***adjustable to the size of the number of issues*** it contains, thereby eliminating all waste space and adding greatly to its appearance. ***This is an exclusive feature.*** The magazines are held in place by means of a wire holder, and can be inserted in less time than it takes to tell about it, without punching holes, pulling strings or mutilating the copies in any way. Successive or intervening issues may be inserted without the necessity of disturbing other issues. You handle only the particular copy that you desire to insert or remove; the others remain in their proper position. Whether an issue be thick or thin, the ***"Expandit" Binder*** is adjustable to its thickness. It embodies every feature that has proved of practical value and it avoids all that are objectionable.



Order your Binder for "Chemical Markets" now

(Can be furnished in *Red* or *Black*)

Price $2.25 each Prepaid

Kindly remit with order

HAYNES PUBLICATIONS, Incorporated

25 Spruce Street — **New York City**

Index to Advertisers

King, E. & F. & Co., Inc., Boston, Mass. 188
Koppers Products Co., Pittsburgh, Pa. 172

Mallinckrodt Chemical Works, St. Louis, Mo. 178
Mann & Co., Inc., Geo., Providence, R. I. 188
Mathieson Alkali Works, Inc., New York City 99
Mechling Bros. Chemical Co., Camden, N. J. 183
Monsanto Chemical Co., St. Louis, Mo. . . Insert facing page 129
Muller, Eduard, Berlin, Germany. Insert facing pages 144 & 145
Mutual Chemical Co., New York City 166

National Aniline & Chemical Co., Inc., New York City 136
Natural Products Refining Co., Jersey City, N. J. 106
Neuberg, William, Inc., New York City 182
Niacet Chemicals Corp., Niagara Falls, N. Y. 174
Niagara Alkali Co., New York City . . . . . Insert facing page 105
Nichols Copper Co., New York City 181

Pacific Coast Borax Co., New York City 191
Pennsylvania Salt Mfg. Co., Philadelphia, Pa. 164
Pfizer & Co., Inc., Chas., New York City 170
Philadelphia Quartz Co., Philadelphia, Pa. 140
Polachek, Z. H., New York City 189

R. & H. Chemicals Dept., E. I. du Pont de Nemours, Wilmington, Del. 162
Rosenthal, H. H. Co. Inc., New York City 190

Sharples Solvents Corp., Philadelphia, Pa. Insert facing page 128
Sherka Chemical Co. Inc., New York City 170
Solvay Sales Corporation, New York City . . . . . Cover 2
Standard Silicate Co., Pittsburgh, Pa. 100
Starkweather, J. U., Co., Providence, R. I. 188
Stauffer Chemical Co., New York City 184
Swann Chemical Co., Birmingham, Ala. 132

Texas Gulf Sulphur Co., New York City 187
Turner & Co., Joseph, New York City 176

U. S. Industrial Alcohol Co., New York City
Insert facing pages 160 & 161
U. S. Potash Co., New York City 176

Victor Chemical Works, Chicago, Ill. 185

Warner Chemical Co., New York City 97
Wishnick-Tumpeer, Inc., New York City . . . . . Cover 4

"We"—Editorially Speaking

Cyanamid's envoy plenipotentiary, E. V. O'Daniel, can, on occasion, ask extremely embarrassing questions. Did you happen to see his letter to the *New York Tribune*, wondering what would happen if the Government were forced to submit to prospective bond purchasers a statement similar to that required of corporations and foreign governments under the Securities Act? That statement would certainly be good reading, particularly the sections covering the repayment of former obligations and the prospects of income sufficient to meet future obligations.

When some politician talks glibly about "increased purchasing power," just translate these words into "income". You will find it extremely helpful and very illuminating.

And when it comes to a brain trusty's description of gold dollars, simply translate this into "purchasing power". This has been done in an article, in this issue, for a few chemicals, comparing their price history, both in Great Britain and the United States, since these two countries went off gold. We checked Mr. Leyden's article over with one of the alkali producers and his only comment was "My God! what a jolt in the teeth."

Volume 13 of Monsanto's "Current Events" defies the hoodoo by putting on a new dress and giving original evidence to its indifference of the jinx. A most interesting feature is a double-spread representing the hobbies of Monsanto employees, which apparently range from growing sweet potatoes to taxidermy, with painting and sculpture ranking astonishingly high.

New York Chapter, National Association of Cost Accountants, recently had Dr. Walter E. Spahr, Professor of Economics, New York University, address them on the economics of business recovery. In part, what he told them is presented in this issue. If you haven't exactly made up your mind as to what deflation, inflation, and gold dollars can do to business recovery, here is your opportunity to arrive at a definite conclusion through this summation of Dr. Spahr's. Besides being Secretary-Treasurer of the Economists' National Committee on Monetary Policy, he is the well known author of several books treating on business and Federal economics, and has taught at Columbia, Dartmouth, Princeton, University of Wisconsin.

The Washington gossip writers seem to have been making some chemical contacts lately, for Whelpley, of Chilean Nitrate, and Lammot du Pont have both been written up lately. As usual, some of the chemistry involved in these stories is pretty much askew.

A hint to the writer of McGraw-Hill's house advertising—Why cramp your florid style by sticking to preposterous percentages when you might, with perfect truth, claim that *"Chemical & Metallurgical Engineering*, during 1933, carried 854 more pages of advertising than any chemical journal in the world with the name 'Metallurgical' in its title?"

Lord Melchett is an interesting, and to us Americans, inexplicable young man. He takes himself pretty seriously, as one in his position should, but plainly does his own thinking and along original lines. Considering his background, the view which he expresses in the article we publish in this issue, which is abstracted from a recent address of his before a group of professional accountants, is a rather radical point of view of the stockholders' shares and rights. It's going to make a good deal of difference to the British chemical industry, if he is or is not content to be a prophet or whether or not he develops into an executive of decisive action.

George I. Cooper, has had ten years' experience in research connected with the manufacture and conversion of paper and paper products, seven years of which were spent in the research laboratories of the Dennison Manufacturing Co.

New Jersey Zinc's last statement reports a net of $1,514,909—"including $418,267 proceeds from patents." The Round Table at the Chemists' Club is going to figure just how much of this should be credited to Celanese.

Speaking of finances as one is apt to do this time of the year, the dividend policies of du Pont in distributing ninety per cent. of earnings to stockholders almost restores our faith in Santa Claus.

The Bureaucrats

The farmer fears a plague of rats,
The angler's worried by swarms of gnats,
Birds are in daily dread of cats,
Nurses are nagged by peevish brats,
But worse than rats, gnats, cats, or brats,
For the hapless victims of rate or tax,
Is the growing army of bureaucrats.

—*From "The Independent."*

Now that there is an approved witch hazel code, how about one for arnica?

At a symposium conducted by the Niagara Chapter, A. I. C., attention was focused upon the question of contracts between chemists and employers, stress being laid on the fact that great misunderstanding commonly arises because of insufficient knowledge on the part of contractants at the time of formulating their agreements. Anyone wishing information of this kind is invited to get in touch with the Institute.

Arthur J. Norton, one of the speakers on the above program, graduated from Harvard with a B. S. in 1920. For one year he worked in the research laboratory of the Norton Company; then entered the Department of Pharmacology at Harvard Medical School for two years; was assistant to the chemical director of Powers, Weightman, Rosengarten & Co. for five years; afterwards connecting with General Plastics.

Fifteen Years Ago

From our issues of February, 1919

Chemical trade plans export association under Webb Law.

National Oil Products plan to erect new building at Milwaukee. Site will cover ten acres and buildings will cost $100,000.

National Aniline consider plans for campaign of education to eradicate false propaganda regarding American dyestuffs.

Barrett Company closes phenol contract with Standard Oil, causing rise in Barrett stock.

Carus Chemical Company, Illinois, incorporated. Capital, $200,000.

Chemical Foundation incorporated in Wilmington as holding company for several thousand German-owned chemical and dye patents which are to be leased to American manufacturers.